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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT FOR STUDY AREA 39 NTC ORLANDO FL

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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT

STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

Unit Identification Code: N65928

Contract No.: N62467-89-D-0317/107

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April 1999

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: April 15, 1999

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Richard Allen
Project Technical Lead

(DFAR 252.227-7036)

EXECUTIVE SUMMARY

Harding Lawson Associates, Inc. (HLA) under contract to the Southern Division, Naval Facilities Engineering Command, has prepared this Site Screening Report for Study Area (SA) 39, located at the Naval Training Center, Orlando, Florida. This report was prepared under the Comprehensive Long-Term Environmental Action, Navy (CLEAN) Contract No. N62467-89-D-0317 as Contract Task Order No. 107.

The objective of the site screening investigation was to locate and identify any compounds that may be present at concentrations in excess of screening criteria. The investigation required several phases to complete. During the initial episode of screening, the surface soils at the site were found to have concentrations of polynuclear aromatic hydrocarbons (PAHs) and arsenic in excess of screening criteria. The investigation also demonstrated that the groundwater of the surficial aquifer had concentrations of chlorinated hydrocarbons, primarily tetrachloroethene (PCE) in excess of State and Federal maximum contaminant levels. Accordingly, the Orlando Partnering Team requested supplemental screening investigations designed to evaluate and characterize the PAHs and arsenic in surface soils.

The supplemental surface soil field program involved the collection of surface soil samples from a grid placed over the entire site. The samples were analyzed onsite using immunoassay testing techniques with a percentage of the samples submitted to an off-site laboratory for confirmation of the type and concentration of the PAH compounds present. The samples submitted to the laboratory were also analyzed for arsenic. The results of the supplemental surface soil investigation allowed for delineation of the total PAH and arsenic concentrations in surface soils across the site. These data were then used in a Focused Risk Assessment (FRA) to determine whether or not PAHs and arsenic in surface soil may pose a potential risk to future users of the site.

The results of the FRA demonstrated that the potential future reasonable *maximum* exposure for residential use of the site could result in a cancer risk of 1×10^{-5}. This risk level exceeds the cancer risk target established by the Florida Department of Environmental Protection (i.e., 1×10^{-6}). The FRA also concluded that the potential future average residential risk posed by exposure to surface soil was at an acceptable cancer risk level of 1×10^{-6}. The cancer risk range, 1×10^{-5} to 1×10^{-6}, presented by these scenarios presents information for the risk manager to use as perspective into the risks presented by the site as a whole.

The FRA was completed at a time when the planned reuse for this parcel was a combination of office and residential. Since then, the reuse has been changed to nonresidential. Under a nonresidential reuse scenario, concentrations of arsenic and PAHs in surface soil meet screening criteria (ABB Environmental Services, Inc., 1997e). However, institutional controls in the form of land use restrictions would be necessary to protect future users.

The supplemental groundwater field program was initiated with the collection of groundwater samples within the surficial aquifer using direct push technology (DPT). These samples were analyzed with an onsite field laboratory combined with off-site laboratory confirmation to determine the general degree and limits of chlorinated hydrocarbons in groundwater and to locate permanent monitoring wells. Groundwater samples were subsequently collected from the monitoring wells along with surface and subsurface soil, and surface water and sediment samples from neighboring Lake Gear. Hydraulic conductivity testing results were combined with the lithology to characterize the local hydrogeology.

The results of the supplemental groundwater screening investigation indicated the presence of a chlorinated hydrocarbon plume (primarily PCE) beneath the southeast corner of the site. The plume is elliptical in plan view, measuring approximately 300 feet long by 100 feet wide. The downgradient portion of the plume is not well defined due to the presence of a utility corridor along the northern shoreline of Lake Gear. The long axis of the plume is oriented southeast in the direction of groundwater flow. The highest PCE concentrations were detected along the upper surface of a sandy clay layer at a depth of 30 to 32 feet below land surface (bls). In the southeast corner of the site, the clay layer is thinner and the sand content increases. In that area, contaminants have migrated downward through the sandy clay layer to a depth of up to approximately 60 feet bls. A natural attenuation assessment survey indicated that the subsurface environment was not favorable for natural attenuation of the chlorinated hydrocarbons.

Permanent monitoring wells installed to confirm the results of the DPT groundwater screening have confirmed the presence of PCE, but at significantly lower concentrations than were reported during screening. The highest PCE concentration reported was 27 micrograms per liter in well OLD-39-19C, screened at 45 to 50 feet bls.

Seven monitoring wells were destroyed by the City of Orlando during recent utility construction activities along the south property line of the Main Base. It will be necessary to reinstall these wells for future groundwater monitoring activities. After the wells are reinstalled, HLA recommends that a quarterly groundwater monitoring program be implemented. Quarterly monitoring (for volatiles and natural attenuation parameters) would be reevaluated after 1 year. HLA further recommends that a temporary groundwater use restriction be imposed for the shallow portion of the surficial aquifer pending results of the groundwater monitoring program. HLA also recommends an evaluation of remedial options along with a cost benefit analysis.

With regard to the surface soils at SA 39, HLA recommends that institutional controls be implemented restricting the future reuse of this parcel to nonresidential. This will provide an adequate level of protection to future site workers and users of this parcel.

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CPT	cone penetrometer testing
DCE	dichloroethene
DNAPL	dense nonaqueous-phase liquid
DPT	direct-push technology
DQO	data quality objective
EOD	explosive ordnance disposal
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
FRA	Focused Risk Assessment
GC	gas chromatograph
GCTL	groundwater cleanup target level
GPR	ground penetrating radar
HLA	Harding Lawson Associates, Inc.
IA	immunoassay
MCL	maximum contaminant level
$\mu g/\ell$	micrograms per liter
$\mu g/kg$	micrograms per kilogram
mg/kg	milligrams per kilogram
NTC	Naval Training Center
OPT	Orlando Partnering Team
PAH	polynuclear aromatic hydrocarbons
PCE	tetrachloroethene
pCi/ℓ	picocuries per liter
pCi/g	picocuries per gram
POP	project operations plan
PVC	polyvinyl chloride
RBC	risk-based concentration
RGO	remedial goal option
RME	reasonable maximum exposure
SA	Study Area
SCM	site conceptual model
SCTL	soil cleanup target level

SPT	standard penetration test
SVOC	semivolatile organic compound
TAL	target analyte list
TCE	trichloroethene
TCL	target compound list
TMP	Tank Management Plan
TPH	total petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UNF	Unnumbered Facility
USCS	Unified Soil Classification System
UXO	unexploded ordnance
VOC	volatile organic compound

1.0 STUDY AREA 39, STRUCTURE 4060, STRUCTURE 4067, STRUCTURE 15109, AND UNNUMBERED FACILITY 10

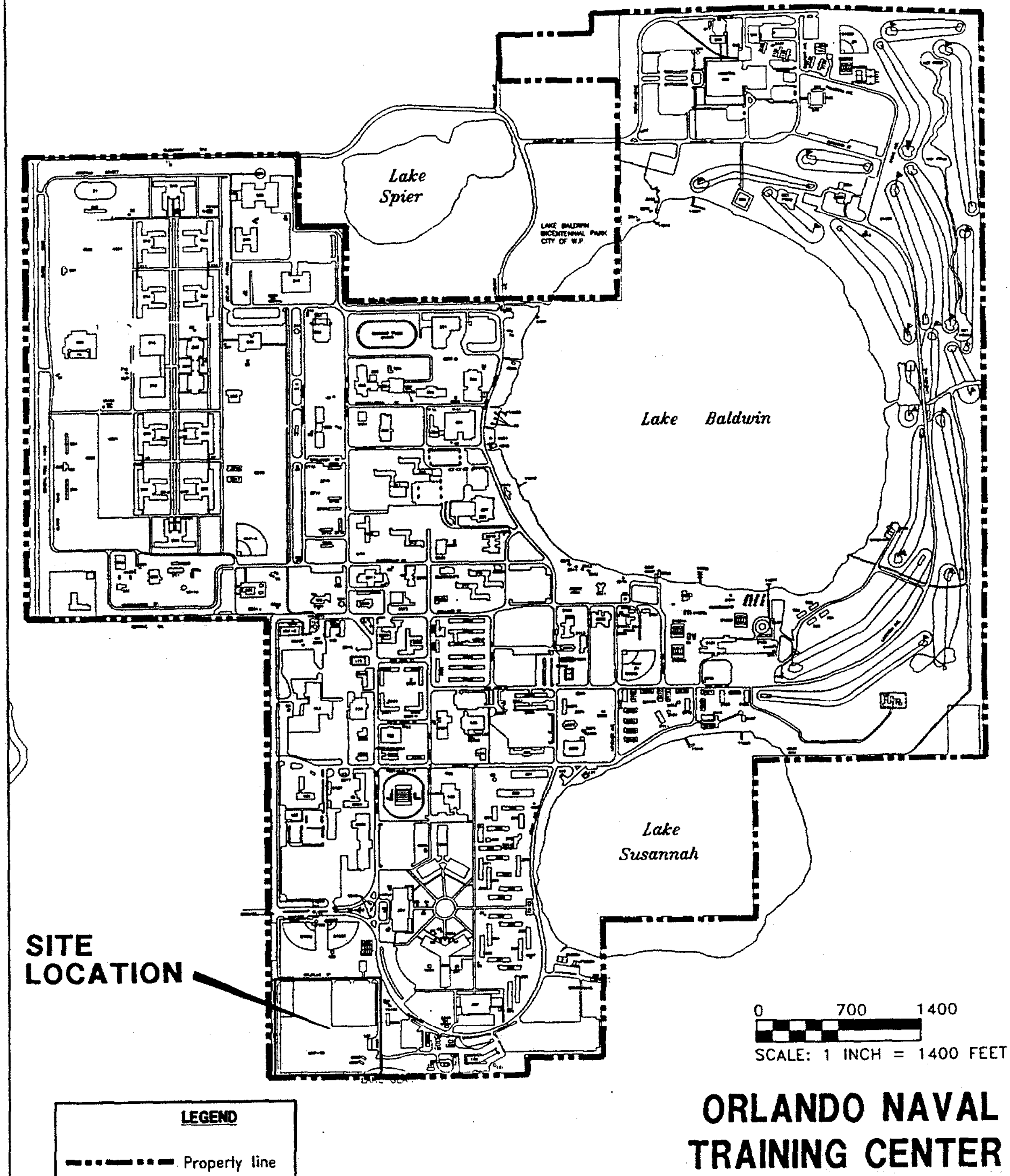
1.1 INTRODUCTION. This report contains information gathered as a result of site screening activities conducted at Study Area (SA) 39. The focus of site screening investigation activities was the former uses of the site as a coal storage yard and for alleged landfill operations, as well as the current use as solid and hazardous materials storage and handling areas. The initial phase of screening fieldwork began in January 1996. Because of exceedances of screening criteria for both the soil and groundwater at that time, additional site screening was performed to determine the nature and extent of impact. The supplemental site screening work was completed in May and September 1997.

1.2 BACKGROUND AND CONDITIONS. SA 39 is located in the southwest corner of the Main Base of the Naval Training Center (NTC), Orlando (Figure 1-1). The study area encompasses approximately 10 acres of land bounded on the south and west by the Main Base's western property line, on the east by Grace Hopper Avenue, and on the north by Nautilus Street. Most of the west side of SA 39 is undeveloped and covered with grass except for a small stand of trees in the southwest corner (Figure 1-2). The northwest corner of the area is occupied by a fenced parking lot used by base personnel. The northeast corner is paved and used for vehicle parking. A stormwater detention pond occupies the area between the two parking lots. The detention pond is finished at approximately 6 feet below grade.

Surface runoff from the study area drains to the detention pond and then into Lake Gear, a small lake (approximately 500 feet in diameter) located immediately south of the base. Lake Gear is likely a "sinkhole lake," implying formation through sinkhole development. Although there are no known studies to substantiate this claim, Lake Gear appears to be morphologically similar to documented sinkhole lakes in the area (Beck et al, 1968).

There are several structures in the southeast corner of SA 39, including two large solid waste receptacles (dumpsters) and their loading ramps (Structures 4060 and 4067). The ground surface in the areas adjacent to the dumpsters is used for the temporary staging of larger waste items awaiting disposal (i.e. trees and brush). The facility's grounds maintenance contractor utilizes the area to the east to house a small, mobile trailer office building and a fenced storage yard. The Hazardous Materials Storage Facility (Building 137) is located further to the east.

In addition to the current site activities, this area was targeted for screening because the southwest corner was used for coal storage when the base's utilities were powered by coal (ABB Environmental Services, Inc. [ABB-ES], 1995a and 1995b). The former coal storage area was designated Unnumbered Facility (UNF) 10. A second area of concern was that the western half of the site (north of the coal yard) was used as a "bottle" landfill (UNF 6) prior to 1947. Most of the landfill is actually contained within SA 40, located immediately north of SA 39. This landfill was reportedly utilized for the disposal of demolition debris that may have included asbestos-containing material, small armaments, medical wastes, and household refuse.



ORLANDO NAVAL TRAINING CENTER

FIGURE 1-1
LOCATION OF STUDY AREA 39

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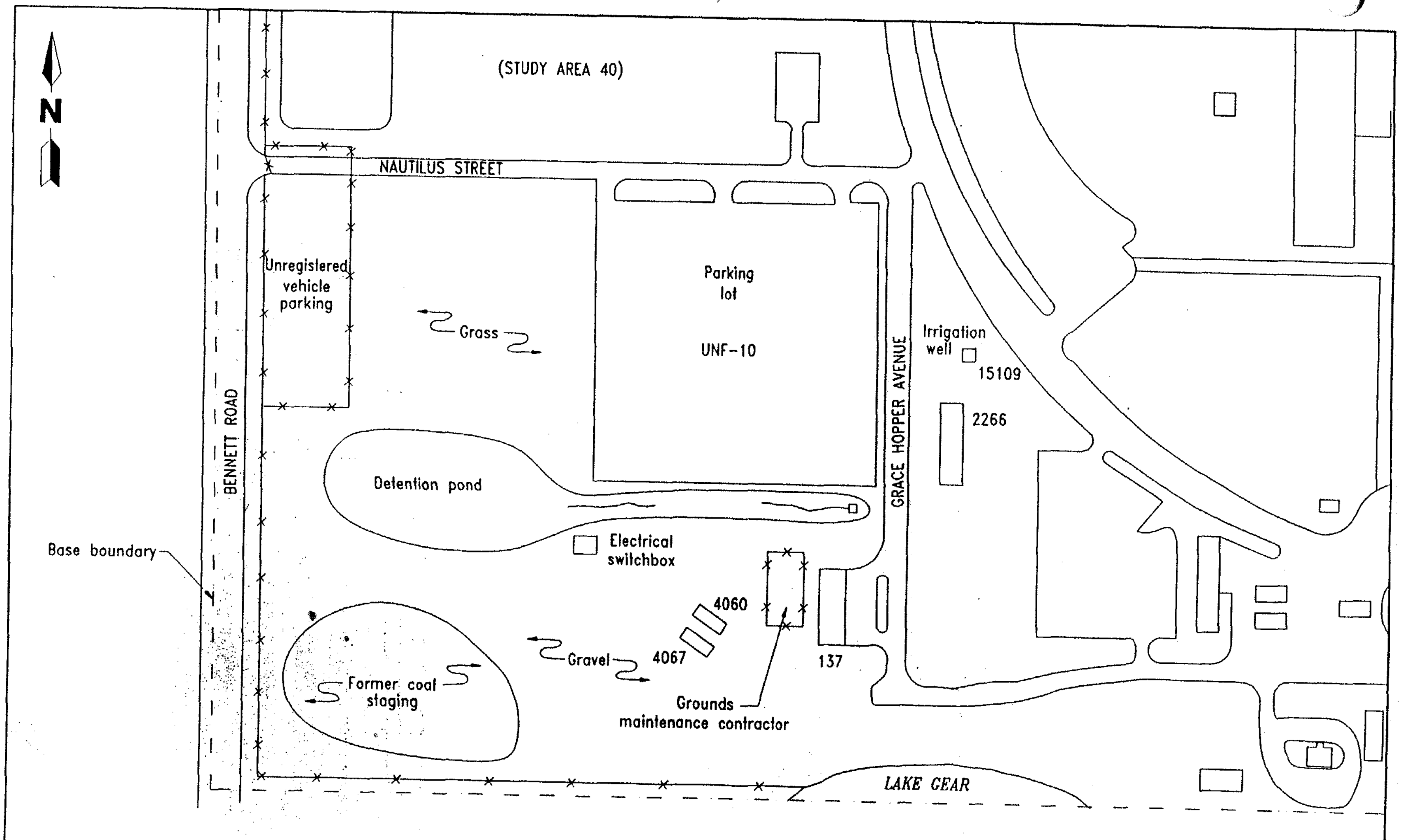
BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA



LEGEND

UNF Unnumbered facility

0 100 200

SCALE: 1 INCH = 200 FEET

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FIGURE 1-2
LAYOUT OF STUDY AREA 39

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

2.0 INITIAL SITE SCREENING INVESTIGATION

The objective of the site screening investigation was to determine whether or not environmental media have been impacted from current or historical land uses. Initial screening investigations at SAs 39 and 40 were performed concurrently because of their proximity, but this document focuses only on the results at SA 39. The workplan for initial site screening is detailed in the Site Screening Plan, Former Air Force Sites (ABB-ES, 1995b). The initial phase of screening was performed during the period from January through April 1996 and was reported in a technical memorandum in June 1996 (ABB-ES, 1996). The results are summarized below. All field methodology used at SA 39 was performed in a manner consistent with the guidelines prescribed in the Project Operations Plan (POP) for NTC, Orlando (ABB-ES, 1997f).

2.1 FIELD PROGRAM. The field program for the initial screening investigation at SA 39 began with a geophysical survey designed to map any buried metal objects that might be indicative of potential unexploded ordnance (UXO). The geophysical survey was followed, in order, by the UXO survey, a passive soil gas survey, and the collection of soil and groundwater samples for laboratory analysis. A description of these activities is provided below.

2.1.1 Geophysics A geophysical survey was completed at SAs 39 and 40. The survey was designed to locate buried objects that could pose a threat to the environment (e.g., buried drums and UXO). The survey involved the use of a magnetometer and time domain metal detector to locate metallic objects and was followed by a confirmatory ground penetrating radar (GPR) survey.

Prior to performing the survey, a grid coordinate system was established across the area to determine the relative location of any target anomalies to be cleared during the subsequent UXO survey. Following the survey, the grid coordinates at the location of each anomaly were recorded in a logbook, and the grid outline was marked on the ground surface by paint and/or pin flags for future reference.

2.1.2 UXO Survey Because of the potential for the presence of UXO in the subsurface, the locations for all of the geophysical anomalies were marked in the field for the UXO survey by the U.S. Navy's Explosive Ordnance Disposal (EOD), Mobile Unit Six, Detachment Mayport, Mayport, Florida. The detachment utilized Mk 26 Ferrous Metal and Mk 29 All-Metals detectors to confirm the location of these anomalies and to survey SAs 39 and 40. The outline of each detected anomaly was flagged at the surface, and any object located within 4 feet of the surface was excavated for a visual inspection. A description of all the excavated material was recorded by the detachment.

2.1.3 Passive Soil Gas A passive soil gas survey was performed to locate areas underlain by volatile or semivolatile organic compounds (VOCs or SVOCs) present in the subsurface. Areas with detections would then become the focus of subsequent soil and groundwater sampling.

Soil gas data are always semiqualitative, because multiple sources in soil and/or groundwater cannot be differentiated. Further, compound concentrations in each collector are compared on a relative basis, depending on whether or not the data are interpreted to be of high, moderate to high, moderate, etc., intensity. These qualitative soil gas values do not represent actual concentrations of the reported compounds. Efforts to relate soil gas response directly to groundwater or soil contaminant concentrations are generally not regarded as productive owing to the assumptions that are required for heterogeneity and source distribution.

Passive soil gas samplers were installed at over 200 locations at SAs 39 and 40 using the grid established for the geophysical survey. In open areas, sample points were established every 50 feet; in the paved areas, the spacing was widened to 100 feet. Each sampler was equipped with two activated charcoal adsorption elements housed in a glass tube. The glass tube was placed upside down in a narrow borehole (approximately 1-1/2 inches in diameter) to a depth of 1 foot below land surface (bls). Following installation, the detectors were covered with a thin layer of soil or, in paved areas, with a thin layer of cement. Several time-calibration samplers were installed at locations within the survey area to measure the rate at which "loading" by volatile gases was occurring. These samplers were retrieved after 2 days and analyzed to determine the optimal period of time the other samplers should remain in place. The time-calibration results indicated the samplers should remain deployed for a period of 7 days before retrieval.

During analysis, one of the charcoal elements was analyzed by thermal desorption/mass spectrometry to measure the ion count of substances detected. If compounds were detected, the second element was analyzed by thermal desorption-gas chromatography/mass spectrometry to identify the compound(s) causing the response.

All sampling and analysis was performed in accordance with U.S. Environmental Protection Agency (USEPA) Level II data quality objectives (DQOs) (ABB-ES, 1997f).

2.1.4 Soil Sampling

2.1.4.1 Surface Soil Eight surface soil samples (0 to 1 foot bls) were collected from the locations shown on Figure 2-1. All samples with an "S" designation are surface soil samples. Any sample collected from a soil boring regardless of whether or not it was a surface or subsurface soil sample was given a "B" designation. Sample 39S001 was collected from the area downgradient of the "bottle" landfill; 39S002 was collected from a small drainage swale; 39S003 and 39S004 were collected from the detention pond; 39S005 was collected from the solid waste receptacles area; 39S006 was collected from the grounds maintenance storage yard; 39S007 was collected just north of the edge of Lake Gear; and 39S008 was collected from the area where large solid waste items are stored.

The surface soil samples were submitted to an approved laboratory for full suite Contract Laboratory Program (CLP) target analyte list (TAL) and target compound list (TCL) laboratory analysis, along with total petroleum hydrocarbons (TPH) and explosives analysis, in accordance with USEPA Level IV DQOs. The sample collected from the grounds maintenance area was analyzed for all of the above parameters plus pesticides and herbicides, in accordance with USEPA Level IV DQOs.

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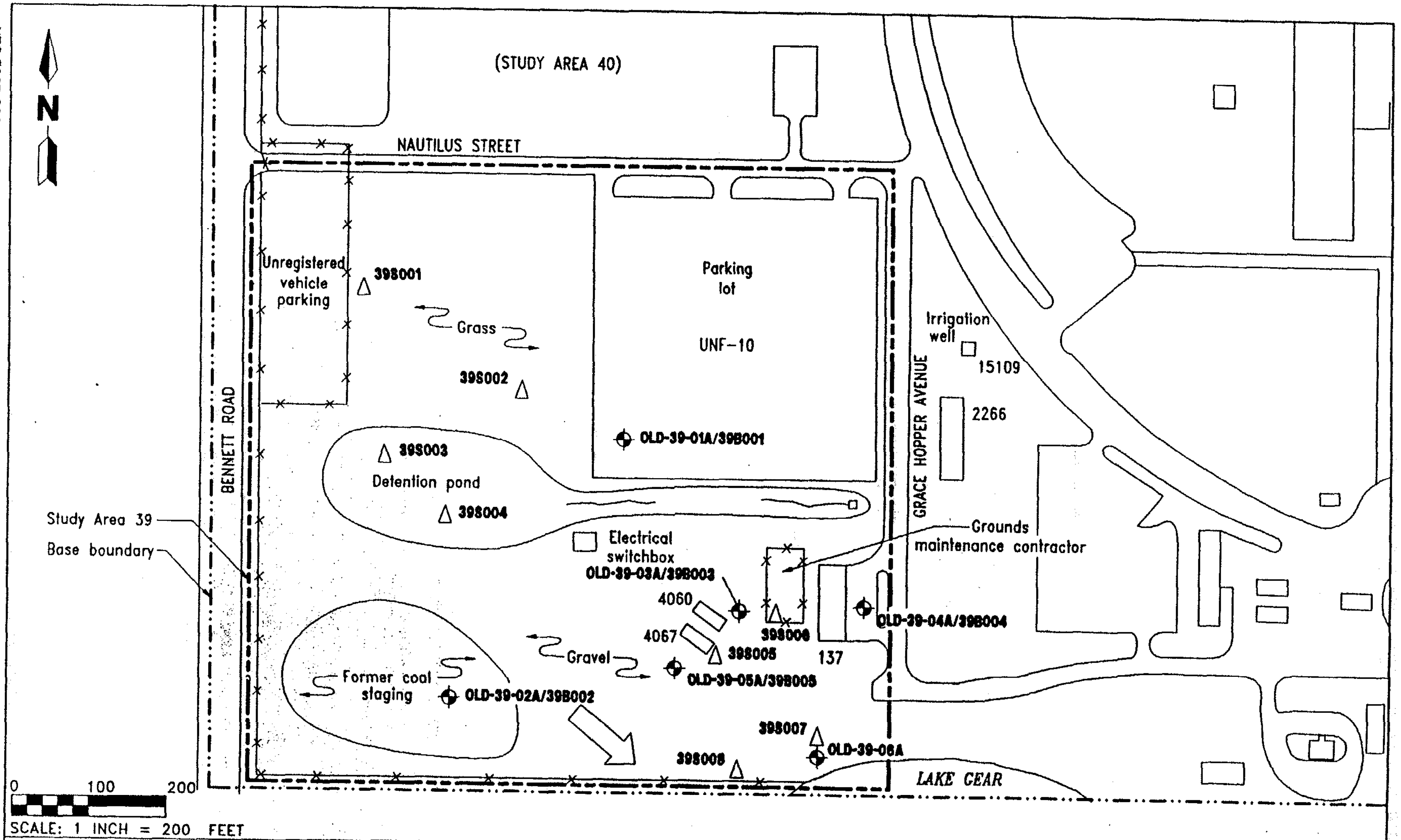

LEGEND

39S002 △	Surface soil sample location and designation
OLD-39-06A ⊕	Monitoring well location and designation
⇨	Groundwater flow
UNF	Unnumbered facility

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FIGURE 2-1
SAMPLING LOCATIONS, INITIAL SCREENING

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

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Three surface soil samples were taken in August 1996 and submitted for gross alpha and gross beta analysis after initial groundwater sampling results indicated exceedances of the maximum contaminant level (MCL) for gross alpha (15 picocuries per liter [pCi/ℓ]) and exceedances of background screening levels for gross beta (10.5 pCi/ℓ). These samples were at surface soil locations 39S00901, 39S01001, and 39S01101. Subsurface soil samples were also taken at these locations and submitted for the same analyses.

2.1.4.2 **Subsurface Soil** Five soil borings completed as permanent shallow monitoring wells (OLD-39-01A through OLD-39-05A) were installed during the initial investigation. Prior to selecting the final locations for these soil borings, three widely-spaced piezometers were installed to confirm the groundwater flow direction, which was determined to be southeast toward Lake Gear. Sample locations were also biased toward geophysical anomalies, soil gas "hot spots," and areas of stained soil. Samples 39B00101 and -02 (monitoring well OLD-39-01A) were located in a soil gas hot spot in the central part of the SA (Figure 2-1); samples 39B00201 and -02 (well OLD-39-02A) were located in the former coal storage area; samples 39B00301 and-02 (well OLD-39-03A) were located in a soil gas hot spot west of the maintenance contractor yard; samples 39B00401 and -02 (well OLD-39-04A) were located in a soil gas hot spot east of Building 137; and samples 39B00501 and -02 (well OLD-39-05A) were located adjacent to the solid waste receptacles.

Subsurface soil samples were collected continuously from the surface to the water table (located approximately 8 to 10 feet bls) from each of the soil borings completed as monitoring wells (OLD-39-01A through OLD-39-05A). Samples collected from the 2-foot interval located immediately above the water table were submitted to an approved laboratory for full suite CLP TAL and TCL laboratory analysis, along with TPH and explosives analysis, in accordance with USEPA Level IV DQOs.

Three subsurface soil samples were taken in August 1996 and submitted for gross alpha and gross beta analysis after initial groundwater sampling results indicated exceedances of the MCL for gross alpha (15 pCi/ℓ) and exceedances of background screening levels for gross beta (10.5 pCi/ℓ). These samples were at surface soil locations 39B00901, 39B01001, and 39B01101. Surface soil samples were also taken at these locations and submitted for the same analyses.

2.1.5 Groundwater As stated in Paragraph 2.1.4.2 above, five soil borings were completed as permanent shallow monitoring wells (OLD-39-01A through OLD-39-05A) during the initial investigation. In addition, one temporary monitoring well (OLD-39-06A) was installed near the northern shoreline of Lake Gear. Following monitoring well installation and development, each of the newly-installed wells was purged using the low-flow technique. A groundwater sample was then collected from each well and submitted for laboratory analysis of TPH, full suite CLP TAL and TCL compounds, in accordance with USEPA Level IV DQOs. Groundwater samples were also analyzed for gross alpha, gross beta, and laboratory analysis of total suspended solids to aid in evaluation of inorganic data. The field data for the monitoring well installation and sampling program, including the soil boring logs, well construction diagrams, and groundwater sampling forms, are presented in Appendix A.

Several episodes of water-level measurements were also made in the monitoring wells to establish the groundwater flow direction and gradient.

2.2 RESULTS. Results of the initial site screening phase at SA 39 are discussed below and are summarized in the Technical Memorandum, Site Survey Investigations, SAs 39, 40, and 45 (ABB-ES, 1996).

2.2.1 Geophysics The results of the geophysical survey identified 11 magnetic and electromagnetic anomalies in SA 39 (and 6 anomalies in SA 40). Each of these disturbances was further investigated with GPR. These objects were interpreted to be located within 4 feet of the surface, and many were later studied during the UXO survey completed by the Navy's EOD team.

A detailed report of the results of the geophysical survey, including the location of the geophysical anomalies, is provided in Appendix B.

2.2.2 UXO Survey The EOD team excavated 8 of the 11 geophysical anomalies mapped by Harding Lawson Associates (HLA) personnel. The remaining three anomalies were excluded because of their depth or position below the paved parking area in the northeast portion of the SA. The EOD team identified an additional 19 anomalies, all of which were excavated for inspection.

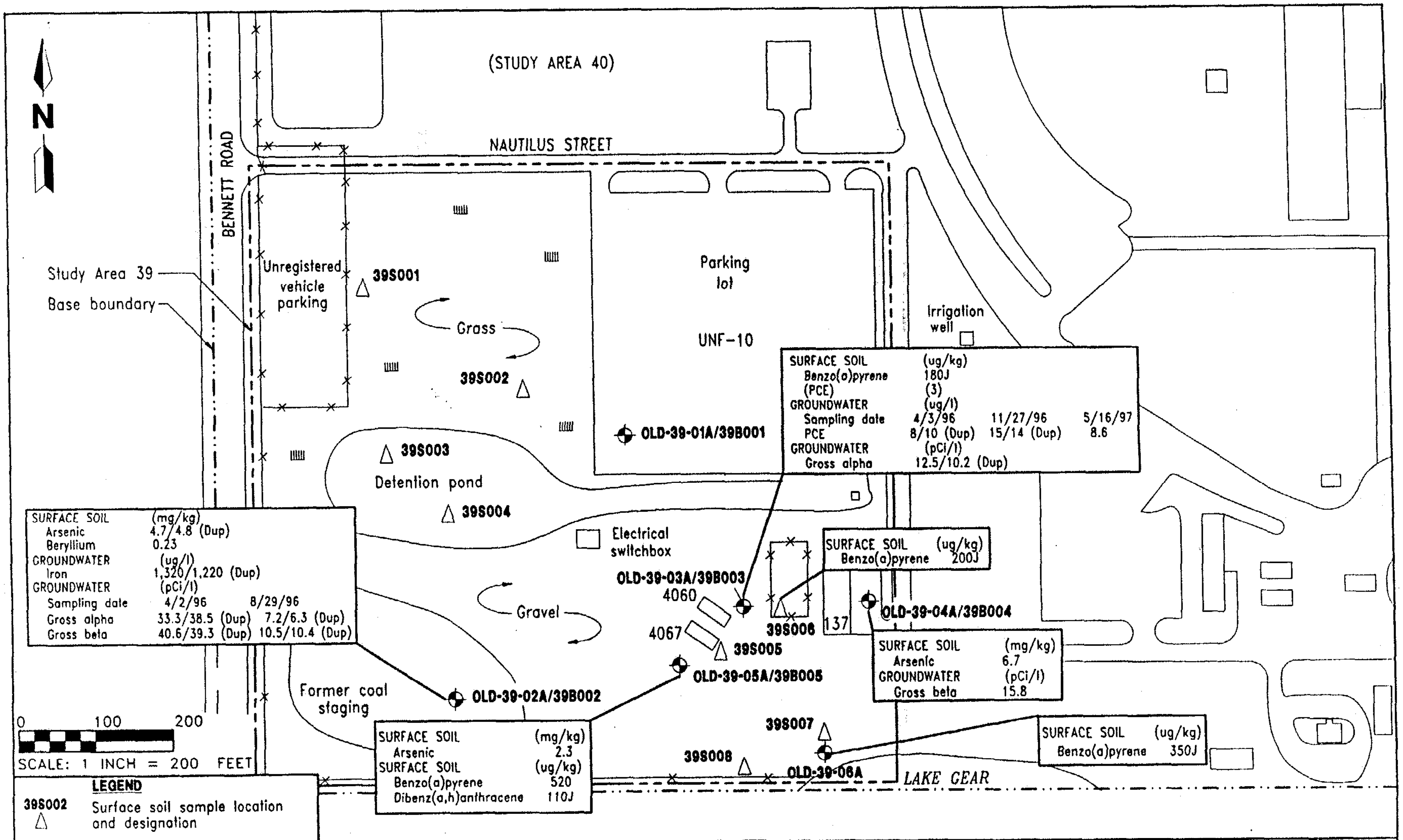
The EOD team found no evidence of any buried UXO at SA 39 (nor at SA 40), such as would have been indicated by fragmental metal, or ordnance components such as fuses, fins, containers, and spent shell casings. The buried material appeared to be related to the historical activities at the site, including survey flags, metal cans, nuts and bolts, and various bits of scrap metal. Based on these findings, the EOD team concluded that further excavation activities to remove any objects beneath the parking area, or greater than 4 feet bls, would be unnecessary.

The report submitted by the Navy's EOD team is provided in Appendix C.

2.2.3 Passive Soil Gas The results of passive soil gas survey indicated the presence of aromatic hydrocarbon, volatile halogenated organic, and SVOCs, as well as chlorinated hydrocarbon gases in the subsurface. The specific compounds belonging to each of these groups were benzene, toluene, ethylbenzene, and xylene; tetrachloroethene (PCE); and C_4-C_9 cycloalkanes/alkenes, respectively.

Aromatic hydrocarbons were mapped throughout the south and southeastern parts of SA 39, and there were several detections in the southwestern and southeastern corners of the parking area. Each of these areas displayed similar relative responses. PCE detections were limited to the southeastern corner of the SA near the waste receptacle loading area. Gases from SVOCs were detected in the same areas as the aromatics, although there was an area of elevated relative response in the southeast corner that was not as strong with the aromatics. The complete results of the survey, including figures presenting the contoured relative response values for the various compounds detected, are provided in Appendix D.

2.2.4 Soil Sampling The analytical results of the surface and subsurface soil samples collected during the initial phase of site screening were evaluated by comparing the concentration of the various compounds detected to screening criteria, including basewide soil background screening levels, Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs), and USEPA Region III Risk-Based Concentrations (RBCs). The nature and location of the



LEGEND

39S002 △ Surface soil sample location and designation
OLD-39-06A Monitoring well location and designation
Groundwater flow
UNF Unnumbered facility
Dup Duplicate sample
(ug/kg) micrograms per kilogram
(mg/kg) milligrams per kilogram
(ug/l) micrograms per liter
(pCi/l) picocuries per liter

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FIGURE 2-2
ANALYTICAL RESULTS, INITIAL SCREENING

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

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exceedances of screening criteria are presented on Figure 2-2 and are discussed below. A summary of the detections in surface and subsurface soil is presented in Appendices E (Summary of Detections) and F (Summary of Analytical Results).

2.2.4.1 **Surface Soil** A variety of organic and inorganic compounds were detected in the surface soil samples at concentrations in excess of screening criteria.

Polynuclear aromatic hydrocarbons (PAHs) that exceeded their respective residential SCTLs were benzo(a)pyrene and dibenz(a,h)anthracene, both with an SCTL of 100 micrograms per kilogram (μg/kg). Benzo(a)pyrene was detected at a concentration of 180 μg/kg in 39B00301, at 520 μg/kg in 39B00501, at 200 μg/kg in 39S00601, and at 350 μg/kg in 39S00701. Dibenz(a,h)anthracene was detected in 39B00501 at a concentration of 110 μg/kg, slightly exceeding screening criteria.

Arsenic was detected at concentrations in excess of the background screening value (1.0 milligrams per kilogram [mg/kg]) in the following samples: 39B00201 (4.7 mg/kg), as well as the duplicate sample collected at the same location; 39B00201D (4.8 mg/kg); 39B00401 (6.7 mg/kg); 39B00501 (2.3 mg/kg); 39S00501 (1.5 mg/kg), as well as the duplicate sample collected at the same location; 39S00501D (1.3 mg/kg); and 39S00601 (1.1 mg/kg).

The three surface soil samples submitted for gross alpha and gross beta analysis (39S00901, 39S01001, and 39S01101) have very low levels of radiological activity. Gross alpha levels range from 0.133 to 0.859 picocuries per gram (pCi/g), and gross beta levels range from 0.267 to 1.48 pCi/g. These values are insignificant when compared to the standard of 5 pCi/g above background for radium-226 and thorium-232 in soil provided in 40 Code of Federal Regulations (CFR) 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."

2.2.4.2 **Subsurface Soil** Several inorganic compounds were detected in subsurface soil samples at concentrations in excess of background screening values, but there were no exceedances of residential SCTLs or leaching values.

Organic detections included several PAHs and aromatic hydrocarbons, but there were no detections above screening criteria. In sample 39B00502, pentachlorophenol was detected at a concentration of 55 J (estimated) μg/kg (Figure 2-2). This concentration is much lower than the leaching SCTL of 800 μg/kg. Leachability-based SCTL values do not apply in this instance, however, because no organic compounds were present in groundwater above FDEP groundwater cleanup target levels (GCTLs).

The three subsurface soil samples submitted for gross alpha and gross beta analysis (39B00901, 39B01001, and 39B01101) have very low levels of radiological activity. Gross alpha levels range from 0.035 to 0.596 pCi/g, and gross beta levels range from 0.031 to 0.68 pCi/g. These values are insignificant when compared to the standard of 5 pCi/g above background for radium-226 and thorium-232 in soil provided in 40 CFR 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."

<u>2.2.5 Groundwater</u> The analytical results of the groundwater samples collected during the initial phase of site screening were evaluated by comparing the concentration of the various compounds detected to basewide background screening levels (inorganics only), FDEP GCTLs, and tapwater RBCs. The nature and location

of the exceedances are presented on Figure 2-2 and are discussed below. The groundwater analytical results from the Phase I investigation are provided in Appendices E (Summary of

Inorganic, organic, and radionuclide exceedances were detected in groundwater samples collected during the initial screening phase. Iron was the only inorganic compound detected at a concentration in excess of the background screening value. It was detected at 39G00201 (well OLD-39-02) at a concentration of 1,320 micrograms per liter ($\mu g/\ell$) (compared to the background screening value of 1,227 $\mu g/\ell$ and a FDEP secondary standard of 300 $\mu g/\ell$). Aluminum was detected at a concentration that exceeded the FDEP secondary standard (200 $\mu g/\ell$) but not the background screening value (4,067 $\mu g/\ell$) at five locations: 39G00101 (well OLD-39-01) at 1,750 $\mu g/\ell$, 39G00201 (well OLD-39-02) at 1,550 $\mu g/\ell$ (the duplicate had the same concentration), 39G00301 (well OLD-39-03) at 257 $\mu g/\ell$ (the duplicate had a concentration of 273 $\mu g/\ell$), 39G00401 (well OLD-39-04) at 1,160 $\mu g/\ell$, and 39G00501 (well OLD-39-05) at 360 $\mu g/\ell$. PCE was detected in one groundwater sample, 39G00301 (well OLD-39-03), at a concentration of 8 $\mu g/\ell$ (the duplicate sample had a concentration of 10 $\mu g/\ell$), versus a Florida and Federal MCL of 3 $\mu g/\ell$.

Radionuclides were detected in excess of background screening values in three samples: 39G00201, 39G00301, and 39G00401. Gross alpha was detected in excess of its background value (13 pCi/ℓ) in 39G00201 and in its duplicate sample at concentrations of 33.3 pCi/ℓ and 38.5 pCi/ℓ, respectively. Gross beta was detected in excess of its background screening value (9.5 pCi/ℓ) in 39G00201 and in its duplicate at concentrations of 40.6 pCi/ℓ and 39.3 pCi/ℓ, respectively; in 39G00301 and its duplicate sample at concentrations of 12.5 pCi/ℓ and 10.2 pCi/ℓ, respectively; and in 39G00401 at a concentration of 15.8 pCi/ℓ. Although background concentrations for gross beta were exceeded, the State of Florida only requires additional analysis and total body dose calculations if the gross beta particle activity exceeds 50 pCi/ℓ (Chapter 62-550.519, Florida Administrative Code).

Monitoring well OLD-39-02 was resampled in August 1996 to confirm the gross alpha and beta radioactivity levels. The levels were significantly lower than during the initial sampling in April 1996: gross alpha levels were 7.2 pCi/ℓ and 6.3 pCi/ℓ (field duplicate), while gross beta levels were 10.5 pCi/ℓ and 10.4 pCi/ℓ (duplicate).

3.0 EVALUATION OF PAHS AND ARSENIC IN SOIL

Upon reviewing the initial site screening results, the Orlando Partnering Team (OPT) tasked HLA to perform supplemental screening designed to evaluate the nature and extent of contamination in the surface soil and groundwater. HLA prepared a workplan for this investigation that was submitted to the OPT (ABB-ES, 1997b). Specific goals of the supplemental screening were to better define the extent of PAH compounds and arsenic in surface soil. The additional soil data permitted a focused risk assessment for surface soils to be completed. Another goal of the supplemental screening was to better define the PCE detected in groundwater (ABB-ES, 1997c). A description of the supplemental field activities and results of the surface soil investigation are presented in this chapter. Details of the groundwater investigation are presented in Chapter 4.0.

3.1 FIELD PROGRAM. The objective of the supplemental soil program was to gather additional soil analytical data so that a Focused Risk Assessment (FRA) could be completed. This required a sampling program in areas of the site not addressed during the original screening investigation. Sampling was performed in a manner consistent with the guidelines prescribed in the POP for NTC, Orlando (ABB-ES, 1997f). The field program is described in detail in a workplan submitted to the Navy in March 1997 (ABB-ES, 1997a).

3.1.1 Immunoassay Screening for PAHs To allow for representative sample collection in the target areas, the original arbitrary grid coordinate system was used. Soil samples were collected every 100 feet and were composited from a depth interval of 0 to 1 foot bls. A total of 48 samples was collected for PAH analysis using immunoassay (IA) analytical techniques (Figure 3-1). Testing is accomplished by first performing an extraction of the collected sample, then mixing the extracted fluid with an enzyme. The enzyme reacts with the PAHs present and, when the mixture is exposed to light, displays an optical signature that varies inversely with the total PAH concentration. Through comparison of the optical density of standard samples with known PAH concentration to that of the test samples, a curve can be generated that correlates optical density to PAH concentration.

3.1.2 PAH and Arsenic Analysis of Confirmation Samples IA analysis allows for a rapid, semiquantitative measurement of the total PAH concentration but cannot distinguish between PAH compounds present. Accordingly, 11 (approximately 20 percent) of the samples were selected from a wide range of PAH concentrations and submitted to an approved laboratory for analysis of PAHs using USEPA Method 3510/8270M, in accordance with USEPA Level IV DQOs. These results would provide confirmation of the accuracy and precision of the IA procedure and quantify the various PAH compounds present.

The 11 confirmation samples were also analyzed for arsenic using the graphite furnace method (USEPA Method 3050-6010) in accordance with USEPA Level IV DQOs.

3.2 RESULTS. The results of the supplemental soil screening for PAHs and arsenic were compared to screening criteria and used to develop an FRA. They are described in detail below.

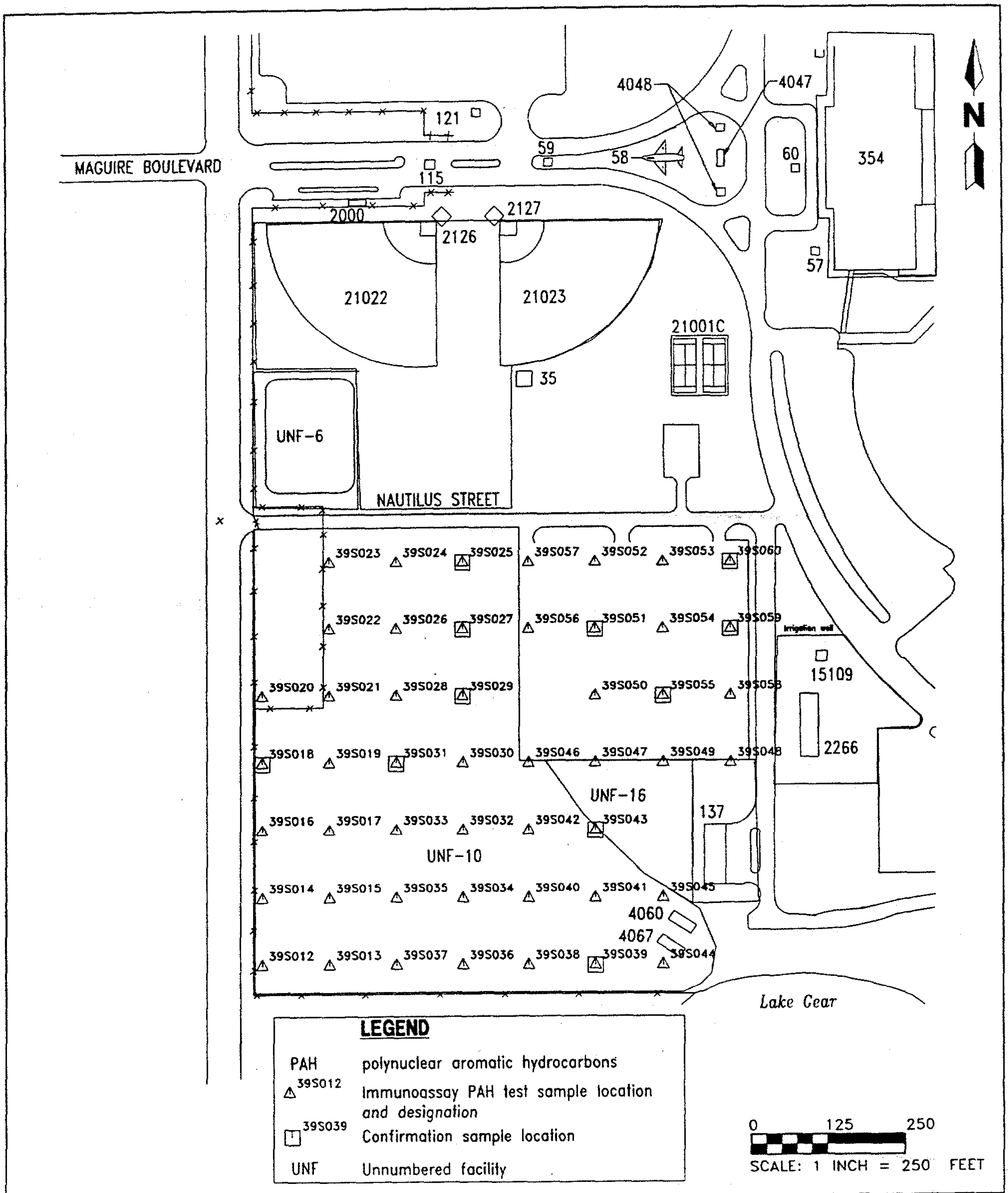

FIGURE 3-1
SAMPLES COLLECTED FOR IMMUNOASSAY PAH TESTING

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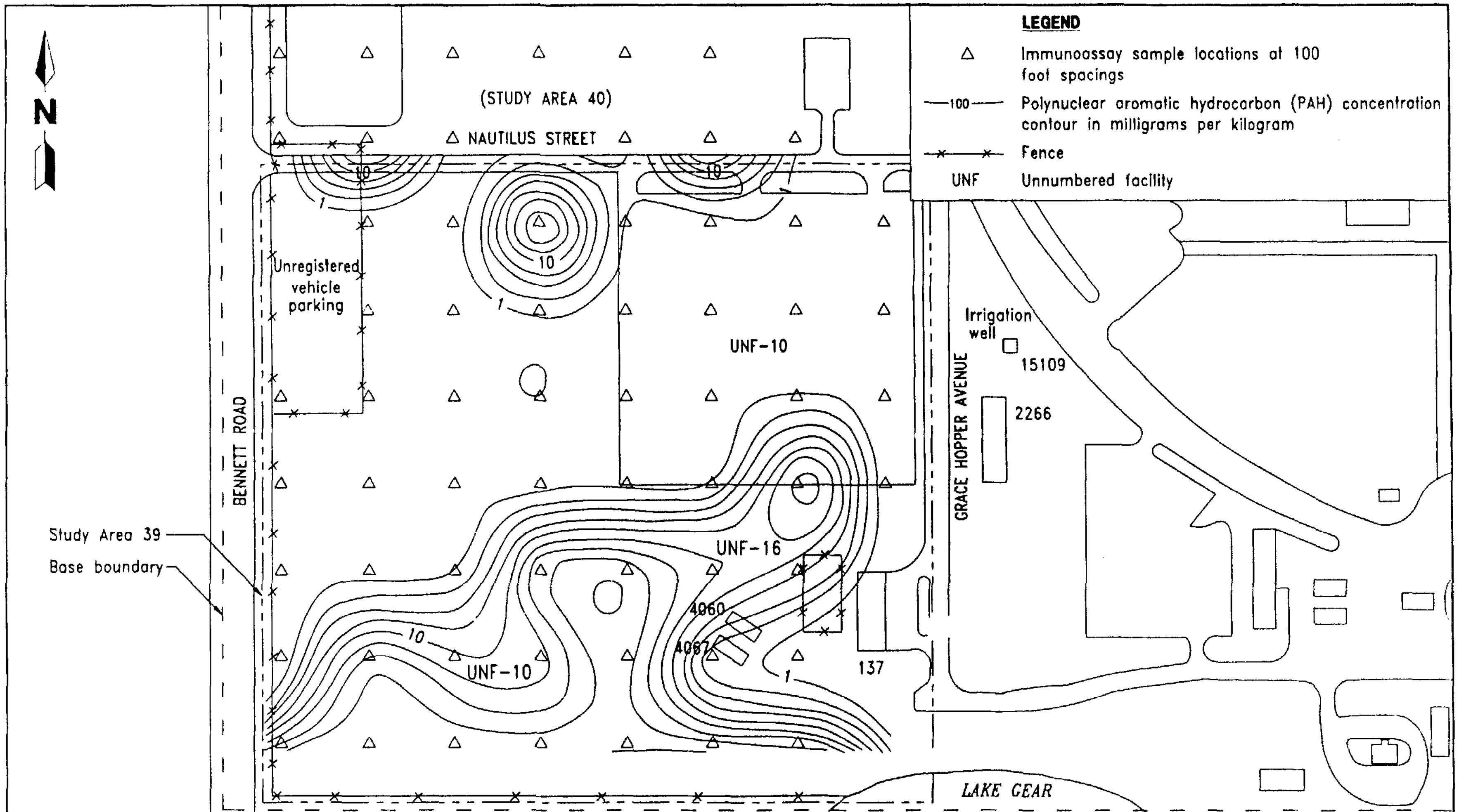
3.2.1 PAHs IA results indicate that there are several extensive areas where the PAH concentration in the surface soil is greater than 1,000 μg/kg (Figure 3-2). The largest area bisects the southeast corner of SA 39 in a southwest to northeast orientation. Another area with elevated PAHs was found in surface soil in the north-central portion of SA 39. A summary of the total PAH results using IA testing for 48 surface soil samples is presented in Appendix G, Table G-1. A listing of the laboratory confirmation results is presented in Appendix G, Table G-2.

Only 3 of the 11 confirmation samples submitted to the laboratory had PAH concentrations in excess of the SCTLs (39S039, 39S043, and 39S060), and all of these were attributed to a single PAH compound, benzo(a)pyrene. The maximum benzo(a)pyrene detection for the 11 samples was 300 μg/kg in 39S043. No PAH detections in any of the samples exceeded the industrial SCTLs. The concentrations of all contaminants that exceed the residential SCTLs are presented on Figure 3-3.

IA results generally compare favorably with the off-site confirmation results, with a calculated correlation coefficient of 0.65 (IA values expressed as greater than 1,000 μg/kg were excluded from the calculation). The favorable comparison between IA and laboratory results is more apparent when the total PAH concentrations are below 200 μg/kg. Concentrations above 200 μg/kg have a relatively high variability (scatter), which can be explained by the fact that as more PAH contamination is encountered in a sample, the complexity of antibody loading to multiple individual PAH receptor sites is much greater. PAH antibodies bind to different PAHs with different affinities.

An alternate evaluation of both screening and confirmatory results is to actually relate these results to a "presence/absence" test, since the primary objective of the field screening program is to determine whether PAH contamination is present at concentrations above screening criteria. The screening criteria used for this evaluation is the residential Florida SCTL for benzo(a)pyrene and dibenz(a,h)anthracene, which is 100 μg/kg. This screening value was compared to the total PAH concentrations, which is conservative, because it represents a total PAH concentration. It is unlikely that the PAHs present are only those with such low SCTLs. IA results indicating the presence or absence of PAHs at concentrations above this screening value are confirmed by the off-site results in 14 out of 16 sampling locations (87 percent) (Appendix G, Table G-2). The other two locations are a false positive (39S051) and a false negative (39S059).

For 16 confirmation samples (11 samples from SA 39 and 5 samples from SA 40), the ratio of carcinogenic PAHs to total PAHs is between 15 percent and 59 percent, with a mean of 40.9 percent, a standard deviation of 11.1, and lower and upper 95 percent confidence interval limits of 35.0 percent and 46.9 percent, respectively. The above sampling statistics can be used to estimate the amount of carcinogenic PAH compounds regarded as "risk drivers" (benzo(a)pyrene and dibenz(a,h)anthracene) from the total PAH concentration of a soil sample (as, for example, with IA). For example, if a sample had a total PAH concentration of 1,000 μg/kg, then there is a 95 percent chance that 35 percent to 46.9 percent (or 350 to 469 μg/kg) of the sample will be composed of carcinogenic PAHs. The complete analytical results are included in the FRA for SAs 39 and 40 (ABB-ES, 1997e).



NOTE:

Three contours between decades

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SCALE: 1 INCH = 200 FEET

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FIGURE 3-2
PAH IMMUNOASSAY TEST RESULTS, SUPPLEMENTAL SCREENING

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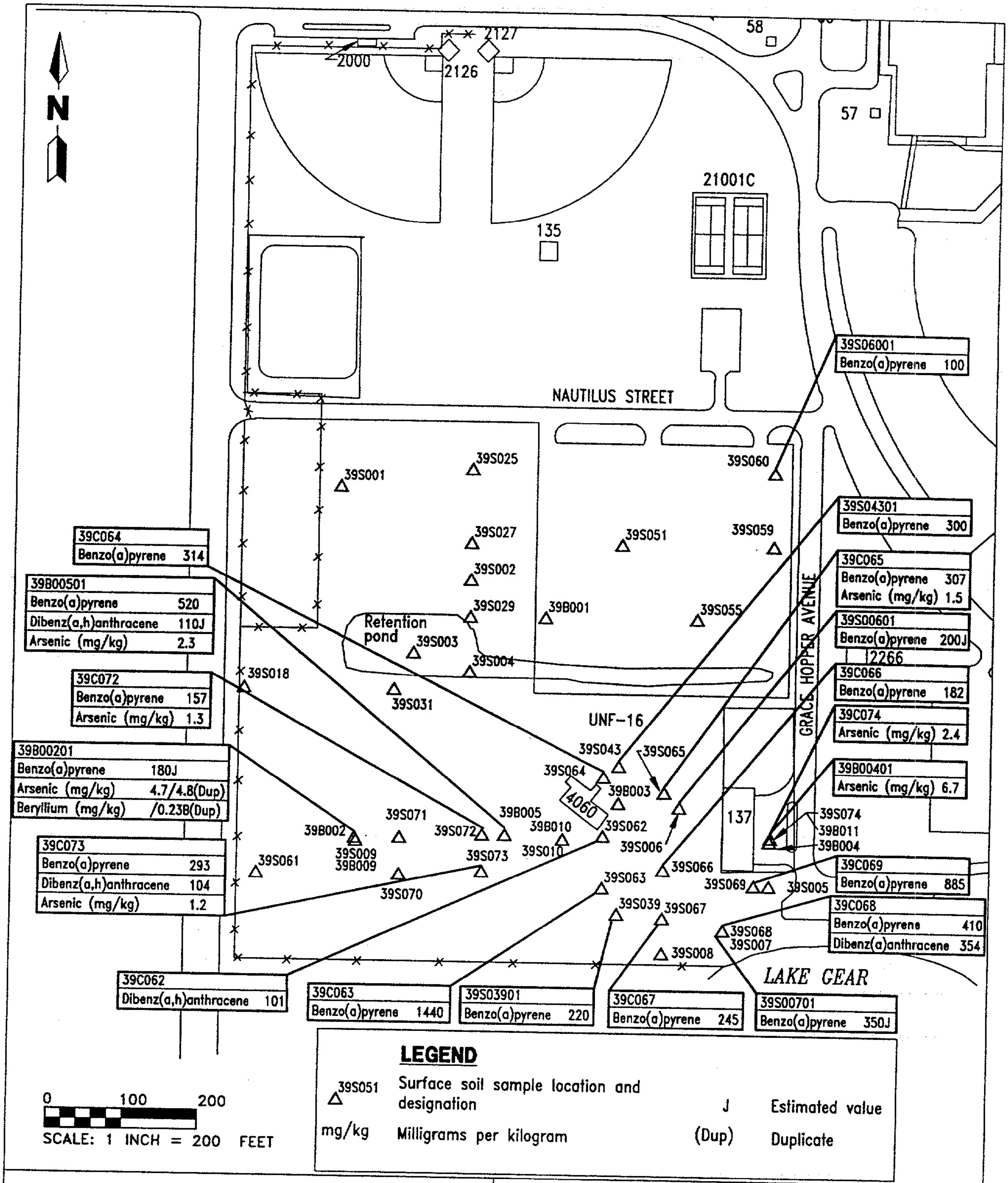

FIGURE 3-3
EXCEEDANCES OF SCREENING CRITERIA IN SURFACE SOIL

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SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

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3.2.2 Arsenic Only 1 of the 11 confirmation samples had an arsenic concentration that exceeds the background screening value (39S043 at a concentration of 2.7 mg/kg). Both the frequency and magnitude of the arsenic detections suggest that arsenic contamination is not significant in surface soil.

3.2.3 Focused Risk Assessment The soil analytical data were used to develop an FRA for SAs 39 and 40 combined. The FRA was performed to assess whether or not the exceedances of SCTLs for PAHs and arsenic pose health risks to individuals under the most conservative reuse scenario (i.e., residential). The FRA was conducted in a phased approach whereby if the future residential scenario resulted in unacceptable risk, then recreational and industrial land-use scenarios would be evaluated. The FRA consisted of five tasks: (1) evaluation of the data, (2) identification of the chemicals of potential concern, (3) exposure assessment, (4) toxicity assessment, and (5) risk characterization. Collectively these components were used to estimate the potential magnitude of exposure and the risks resulting from the estimated exposure conditions.

The results of the FRA demonstrated that the potential future Reasonable Maximum Exposure (RME) for residential use of SAs 39 and 40 resulted in a slightly elevated cancer risk of 1×10^{-5}, which exceeds the cancer risk target established by the State of Florida but is within the acceptable risk range established by the USEPA. The potential future average residential risk posed by exposure to surface soil at SAs 39 and 40 was at an acceptable risk level of 1×10^{-6}. The RME residential cancer risk was based on exposure to arsenic and two carcinogenic PAHs (benzo(a)pyrene and dibenz(a,h)anthracene), which were detected in surface soil. The risk range of the two scenarios evaluated (maximum and average risks) provides risk managers additional perspective into the risks presented by the SAs as a whole. While these conclusions have not been verified for SA 39 alone, it is not expected that they would change substantially if SA 40 results were extracted to a separate database.

The FRA also evaluated the reduction of the risk for exposure to arsenic- or PAH-contaminated soil via remedial action and its effect on lowering the overall surface soil pathway cancer risk estimate. First, remedial goal options (RGOs) were identified. The RGOs established for surface soil at SAs 39 and 40 were the Florida residential SCTLs for the two PAHs and the NTC, Orlando background screening concentration for arsenic.

Based on the RGOs established, the following statements regarding the reduction in the predicted cancer risks were made:

- Remediation of arsenic-contaminated soil to background levels (1 mg/kg) would result in a predicted RME residential cancer risk of 2.5×10^{-6}. This risk level is greater than the FDEP's acceptable cancer risk target of 1×10^{-6}.

- Remediation of benzo(a)pyrene- and dibenz(a,h)anthracene-contaminated soils to the residential Florida SCTLs would result in a predicted RME residential cancer risk of 1.6×10^{-6}; this risk level is greater than FDEP's acceptable cancer risk target of 1×10^{-6}.

In summary, the FRA predicted that the presence of arsenic and two carcinogenic PAHs in surface soil at SAs 39 and 40 may be presenting an unacceptable cancer risk of 1×10^{-5} based on exposure of a future resident to surface soil. Although remediation of surface soil to RGOs would reduce the total predicted cancer risk, the remaining risk upon completion of the remedial action would still present an unacceptable predicted cancer risk of 4.1×10^{-6}.

In order that risk managers gain perspective on the viability of remediating surface soil at the SA and the resultant reduction in risk that would be achieved, the Navy requested HLA to develop cost estimates for various remedial options addressing contaminated surface soil at the SA. The remedial options for which cost estimates were developed consisted of a cross-section of potentially viable technologies to address contaminated surface soil at the SA and included the following:

- treatment (*In Situ* Stabilization)
- containment (Soil Cover/Capping)
- disposal (Excavation and Off-Site Disposal)

The cost estimates developed were presented to the OPT in July 1997 and varied from approximately $500,000 (treatment) to $1.6 million (disposal)(ABB-ES, 1997d). At that time, the Navy requested additional information regarding the vertical extent of surface soil contamination at the SAs. This is because the cost estimates prepared assumed a depth of contamination of 2 feet, which, if less, would reduce the volume of contamination and, hence, the cost of remediation. Accordingly, HLA prepared a sampling and analysis plan for SAs 39 and 40 to evaluate the vertical distribution of arsenic and PAHs in surface soil. This plan was submitted to the Navy on August 27, 1997 (ABB-ES, 1997g). The sampling and analysis plan was implemented in September 1997 and the results are presented below.

<u>3.2.4 Vertical Delineation of PAHs and Arsenic</u> As was stated in Subsection 3.2.3, above, surface soil samples were collected from 14 additional locations (39S061 through 39S074, Figure 3-3) in late September 1997 to delineate the vertical distribution of PAHs and arsenic in the upper two feet of soil. Samples were collected from the intervals 0 to 0.5 feet bls, 0.5 to 1.0 feet bls, and 1.0 to 2.0 feet bls at each location. For these sample locations, the chemical boxes display 39<u>C</u>XXX instead of 39SXXX (Figure 3-3). The values in the chemical boxes represent a weighted combined average for the three samples at a location (e.g., 39S06101, 39S06102, and 39B06101). The concentrations of all contaminants that exceed the residential SCTLs are presented on Figure 3-3.

The most important compounds from a risk perspective during the vertical delineation were benzo(a)pyrene and arsenic. Benzo(a)pyrene was detected in 28 of 34 samples at concentrations of up to 2,800 μg/kg (unweighted), with an average concentration of 438 μg/kg. Arsenic was detected in 22 of 25 samples at concentrations of up to 3.8 mg/kg (unweighted), with an average concentration of 1.2 mg/kg. Statistically, there were no significant differences between samples collected within the three intervals, although the interval from 0.5 to 1.0 feet bls appeared to have slightly higher concentrations of contaminants. The summary of detections in surface soil is presented in Table E-1 of Appendix E. The complete summary of analytical results is presented in Appendix F.

4.0 EVALUATION OF PCE IN GROUNDWATER

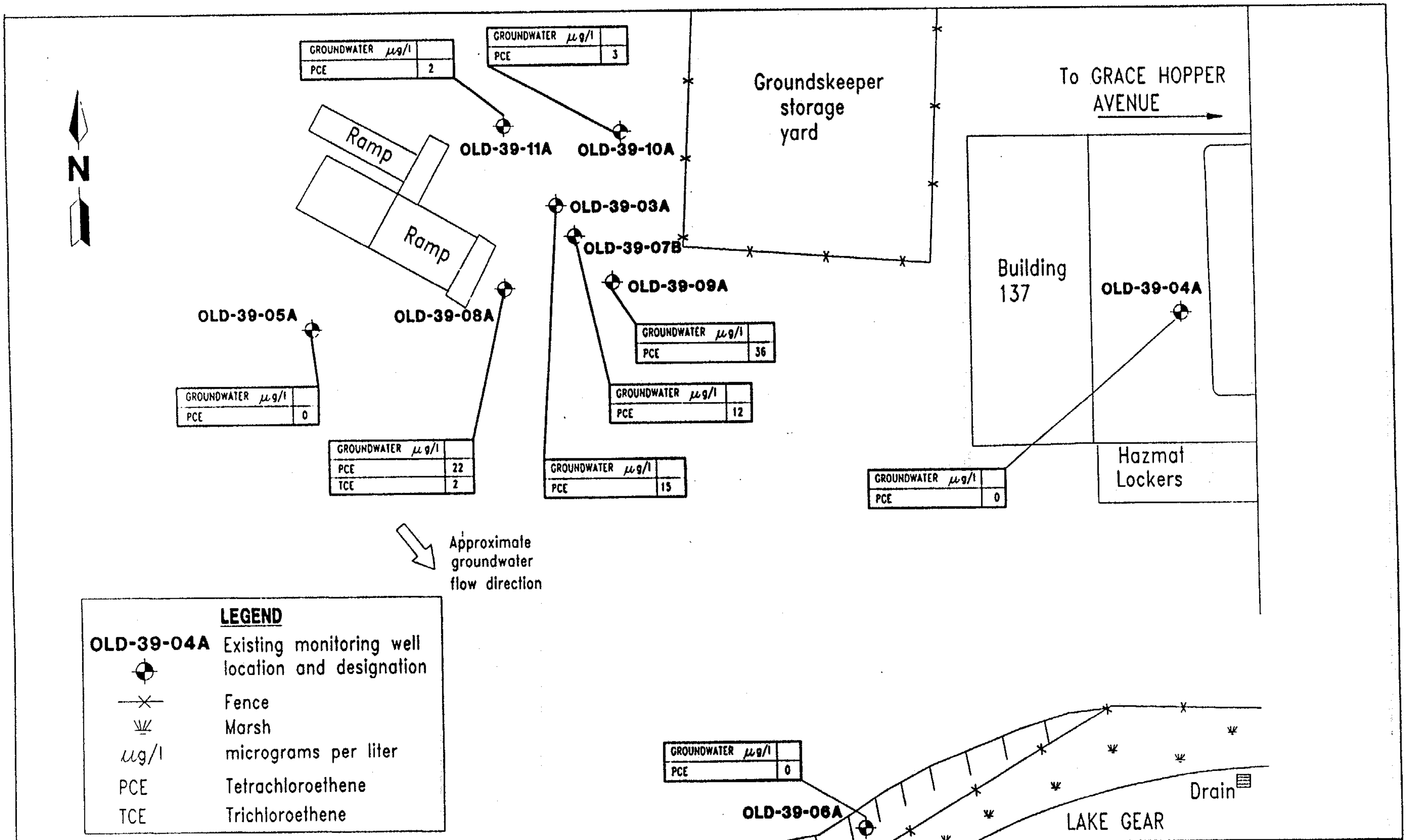
Supplemental groundwater screening investigations to evaluate chlorinated hydrocarbons (hereinafter referred to as PCE) in groundwater were conducted in two phases described below. Phase I began with the installation of several shallow monitoring wells around monitoring well OLD-39-03A where PCE was detected above its Federal and State MCL during initial screening at SA 39. The results of the Phase I investigation showed PCE concentrations in several wells above the MCL; therefore, the OPT requested a more extensive sampling program to determine the nature and extent of PCE in groundwater. Supplemental work performed in response to that request is referred to as Phase II.

4.1 PHASE I FIELD PROGRAM. The objective of the Phase I field program was to confirm the presence of PCE in groundwater at concentrations in excess of the MCL as was reported in one groundwater sample from the initial site screening investigation. Accordingly, five additional monitoring wells were installed in the vicinity of well OLD-39-03A.

4.1.1 Monitoring Well Installation and Groundwater Sampling Five new monitoring wells were installed during the Phase I investigation (Figure 4-1). Four of the wells are shallow wells screened to bracket the water table. These four wells were placed 30 feet away from well OLD-39-03A in a cross pattern oriented in the direction of groundwater flow: monitoring well OLD-39-09A was installed in the downgradient direction, OLD-39-11A was placed upgradient, and the remaining two wells (OLD-39-08A and OLD-39-10A) were placed sidegradient to groundwater flow. The four shallow wells were installed with direct push technology (DPT) using the TerraProbe℠, and they were constructed as microwells. The wells were constructed with 3/4-inch-diameter polyvinyl chloride (PVC) riser and 0.010-inch slotted screen. The screened section was prepacked with a 20/30 silica sand filter pack. Nine feet of slotted screen was used for each well.. A 2-foot thick layer of bentonite was placed above the filter pack as a seal, and the remainder of the borehole was filled with grout. The microwells were completed at the surface with a concrete pad, bolt-down vault, and locking cap.

Because PCE can be present in the environment as a dense nonaqueous-phase liquid (DNAPL), the fifth monitoring well was constructed as an intermediate well to determine if PCE was present at intermediate depths in the vicinity of well OLD-39-03A. Prior to installing the fifth monitoring well, soil samples were collected with a split-spoon sampler from the surface to the shallowest clay layer encountered in the surficial aquifer. The samples indicated the presence of a sandy clay layer at a depth of 31 to 34 feet bls. The shallowest clay in the Hawthorn Group was encountered at a depth of approximately 80 feet bls. The zone between the two clay layers is composed primarily of silts and sands with thin, discontinuous lenses of finer-grained material. The fifth well, designated OLD-39-07B, was placed approximately 10 feet downgradient of well OLD-39-03A and was screened immediately above the shallow clay layer.

All newly installed monitoring wells were developed to remove as many fine soil particles as practical. This was accomplished by pumping groundwater through the well screen at varying flow rates to ensure that the sand pack functioned



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SCALE: 1 INCH = 50 FEET

FIGURE 4-1
GROUNDWATER ANALYTICAL RESULTS, SUPPLEMENTAL SCREENING (PHASE I)

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properly. No fewer than three well volumes were removed during development, which continued until the turbidity, pH, temperature, and conductivity measurements had stabilized.

Following development and a period of stabilization, the five new wells and OLD-39-03A were sampled using the low-flow method. The groundwater samples were analyzed for the presence of VOCs using USEPA Method 524.2. All of the field data sheets associated with monitoring well installation and sampling during the Phase I supplemental work, including the soil boring logs, well construction diagrams, and groundwater sampling data sheets, are provided in Appendix A.

4.1.2 Results Chlorinated hydrocarbons were detected in the groundwater samples collected from OLD-39-03A and each of the five newly installed wells. PCE was detected at all six well locations, and trichloroethene (TCE) was detected at one of the new wells (OLD-39-08A, Figure 4-1). The concentration of PCE ranged from 2 $\mu g/\ell$ at the upgradient shallow well location (OLD-39-11A) to 36 $\mu g/\ell$ at the shallow downgradient well location (OLD-39-09A), compared with a Florida MCL of 3 $\mu g/\ell$. TCE was also detected at a concentration of 2 $\mu g/\ell$ at OLD-39-08A, compared with a Florida MCL of 3 $\mu g/\ell$. The results indicate that the PCE/TCE plume extends to a distance of at least 30 feet in all directions from OLD-39-03A and that concentrations increase downgradient from that well. MCL exceedances for PCE detected in the sample collected from the intermediate well indicated that, at a minimum, the PCE plume extended downward to the top of the shallow clay layer. The groundwater analytical results from the Phase I investigation are provided in Appendices E (Summary of Detections) and F (Summary of Analytical Results).

4.2 PHASE II FIELD PROGRAM. The objective of the Phase II field program was to collect the additional data necessary to define the nature and extent of the PCE plume in groundwater. This was to be accomplished through a groundwater screening program using DPT, followed by the installation of permanent monitoring well clusters to confirm the screening results. A description of the various tasks and results of the Phase II supplemental field program is presented below.

4.2.1 Screening

4.2.1.1 **Cone Penetrometer Testing (CPT)** Prior to groundwater collection and analysis, CPT was performed to evaluate the lithology so that discrete depth intervals could be targeted for groundwater sample collection. Locating lenses of finer-grained soil was important because DNAPLs (including PCE) may accumulate there. CPT utilizes hydraulics to advance a piezocone, which is a device to measure lithologic parameters. Resistance to penetration at the piezocone tip and at the outer surface of the sleeve is recorded. Subsurface pore pressure is monitored with a pressure transducer. These measurements are recorded by a field computer, and the data are compared to empirically derived measurements or parameters characteristic of different soil types. Piezocone data provide soil classifications consistent with the Unified Soil Classification System (USCS).

CPT was performed at eight locations during the investigation (Figure 4-2). The piezocone was pushed to the top of the Hawthorn Group at seven of the eight locations (refusal was encountered at a depth of approximately 25 feet bls at location 39CPT07).

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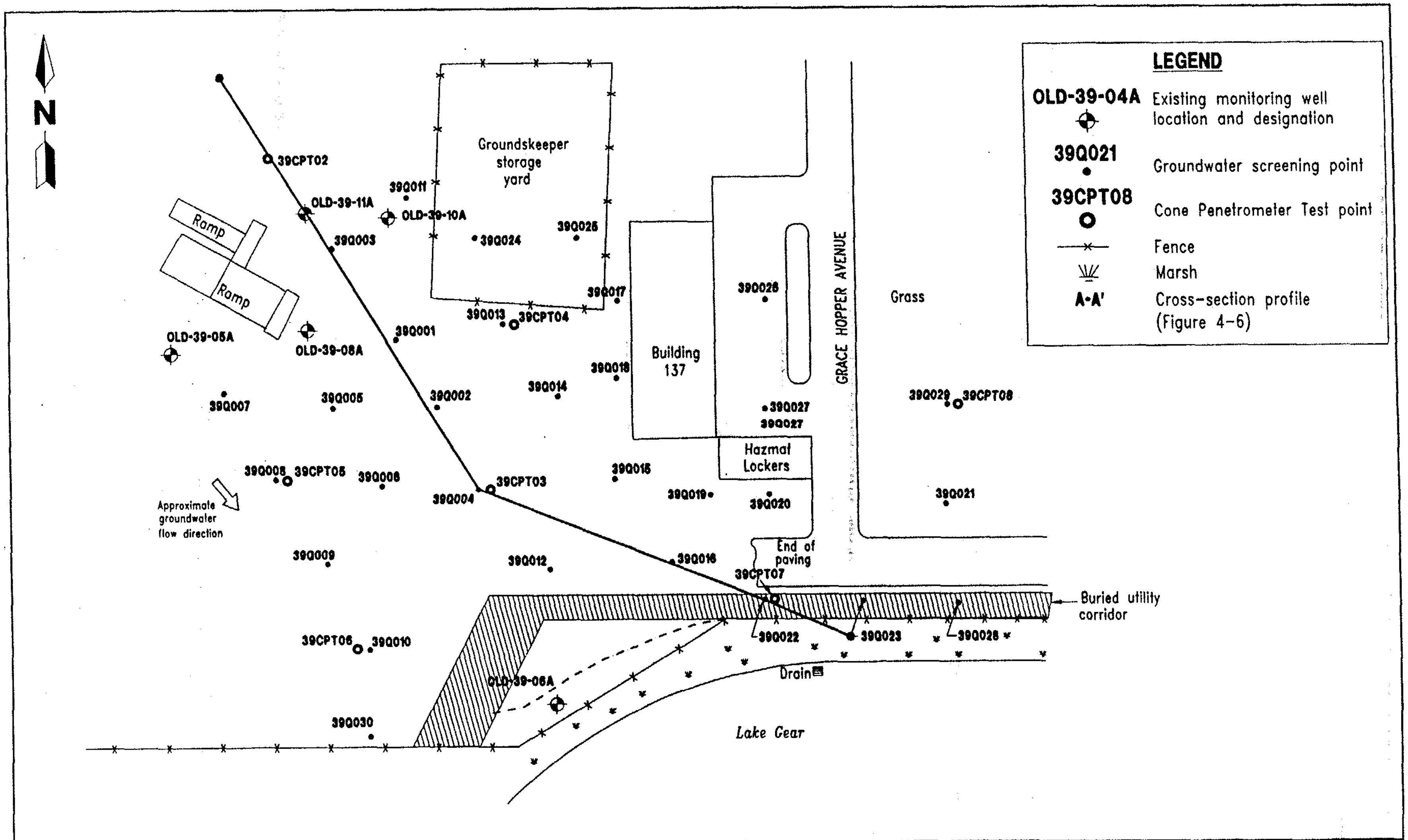

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FIGURE 4-2
CONE PENETROMETER TESTING AND GROUNDWATER SCREENING POINTS

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4.2.1.2 **Groundwater Screening** The objective of the groundwater screening program was to evaluate the general distribution of PCE within the surficial aquifer in order to site permanent monitoring wells.

Samples collected for onsite analysis were analyzed for target VOCs using a gas chromatograph (GC) field laboratory. The analytical methods used were based on standard USEPA Methods SW-846, 5030 (purge and trap preparation), 8000A (GC calibration), and 8010A (halogenated volatile organics) with modifications for field analysis. The specific target compounds were PCE, TCE, 1,1 dichloroethene (DCE), trans-1,2-DCE, and cis-1,2,-DCE. Samples were analyzed using an SRI-8610 GC with a carbosieve trap and a Tenax trap. Two detectors, a 10.2-electron-volt photoionization detector and a dry electrolytic conductivity detector were used.

The quality control criteria for the onsite analytical method were established to monitor method performance. An initial three-point calibration for quantification (low, mid, and high-range concentration) was performed for each instrument. Instrument stabilities were monitored every 24 hours with a calibration standard at the mid-range concentration. The quantification performance criterion for operation was the agreement of the check standard with the three-point calibration curve to within 30 percent. Field samples were to be analyzed only if no more than one compound per detector in the check standard exceeded these criteria. If the check standard did not meet this criterion, then a second check standard was analyzed. If this second check failed to meet the criterion, then a new calibration curve was prepared. The identities of the target compounds were based on comparison with the retention times for the standards. Retention time windows of plus or minus 3 percent were established, based on the most recent calibration curve. In some instances, the peak was so broad that a 3 percent retention time window was not adequate and operator judgement was applied.

Periodic method blanks composed of deionized water were analyzed to confirm that no target compounds were introduced during sampling handling and analysis. The method blank criterion was met if no target compounds were present above the reporting limit for the instrument. A surrogate solution containing bromo-flourobromine was injected into each sample at a known concentration to determine percentage recoveries. The recovery range of 50 to 150 percent was established for water samples, and the recovery range of 30 to 170 percent was established for soil samples as one of the operating criteria for onsite analysis.

<u>Shallow Groundwater Screening</u>. Groundwater sample collection was completed using DPT from locations on 50-foot centers. Sample collection began near OLD-39-03A and the sampling grid was extended in a direction downgradient of groundwater flow. Screening extended to within approximately 20 feet north of the southern boundary of the base, where a utility corridor prevented further sampling. The sampling grid eventually encompassed an area measuring approximately one acre in the southeast corner of SA 39. To the east, screening extended approximately 30 feet east of Grace Hopper Avenue (Figure 4-2), which is the western portion of SA 30. A total of 30 screening points was completed during the study.

Shallow (30 feet bls or less) groundwater collection during the early stages of the investigation was performed with HLA TerraProbe℠. The TerraProbe℠ system utilizes a 2-foot retractable screen for groundwater sample collection. The sampler is composed of a telescoping assembly containing a 2-foot length of stainless steel well screen fitted with an expendable tip. This assembly is hydraulically advanced with a series of rods. The screen was exposed in the subsurface by retracting the outer casing of the sample device, allowing natural hydrostatic pressure to force groundwater into the sampler. Teflon™ tubing was then lowered down to the screened interval, and groundwater was purged out using a peristaltic pump.

TerraProbe℠ operations were limited to the first six screening locations because finer-grained soils were plugging the sampling device. A larger DPT rig was utilized to collect the remaining groundwater samples.

Deep Groundwater Screening. A 25-ton DPT rig was utilized to obtain samples from the surficial aquifer. The DPT rig utilized the hydro-trap groundwater sampler, which consists of a telescoping assembly containing a 1-foot length of stainless steel well screen fitted with a cone tip. This assembly is hydraulically advanced with a series of rods in the same manner as the piezocone. The screen is exposed in the subsurface by retracting the outer casing of the sample device, allowing natural hydrostatic pressure to force groundwater into the sample collection chamber. The sample collection chamber and screen assembly are then lifted to the surface to recover the sample. To collect groundwater from multiple discrete intervals, the hole is reoccupied with a decontaminated sample collection chamber and screen assembly and the hydro-trap is advanced to the next sampling interval. Sample integrity is maintained by using O-rings to form watertight seals above and below the sample chamber, preventing cross contamination.

Sample collection was performed at a 5-foot interval beginning at the water table to as deep as 80 feet bls, depending on the analytical results and lithology at the sample points. In general, samples were collected every 5 feet from 15 to 35 feet bls, and sampling extended deeper in some areas, as appropriate. Approximately 150 groundwater samples were collected for onsite analysis. Groundwater samples were analyzed onsite for PCE and two of its daughter products, TCE and cis-1,2-DCE). Twenty percent of the samples were submitted to an off-site laboratory for confirmatory analysis. Off-site samples were analyzed for VOCs using USEPA Method 524.2.

4.2.1.3 **Soil Screening** Soil screening was performed during the Phase II investigation to determine the presence of VOCs. Results of the groundwater screening investigation were used to target likely source area(s) for the release of PCE into the subsurface. Because the highest concentrations at the water table were detected in the vicinity of screening points 39Q001 and monitoring well OLD-39-03A, soil screening began there. Soil samples were collected at a 2-foot interval from the surface to the water table (approximately 12 feet bls). Ten borings (39B007 through 39B016) were placed along a grid with a 20-foot spacing in that area (Figure 4-3). The samples were collected with a stainless steel hand auger, scanned for organic vapors using a flame ionization detector (FID), and placed in sample jars. All of the soil samples were analyzed onsite for the same target compounds as the groundwater. Twenty percent of the samples were submitted to an off-site laboratory for confirmation analysis using USEPA Method 8010. No positive FID readings were noted during any of the soil sampling, so all confirmation samples were collected at the interval just above the water table.

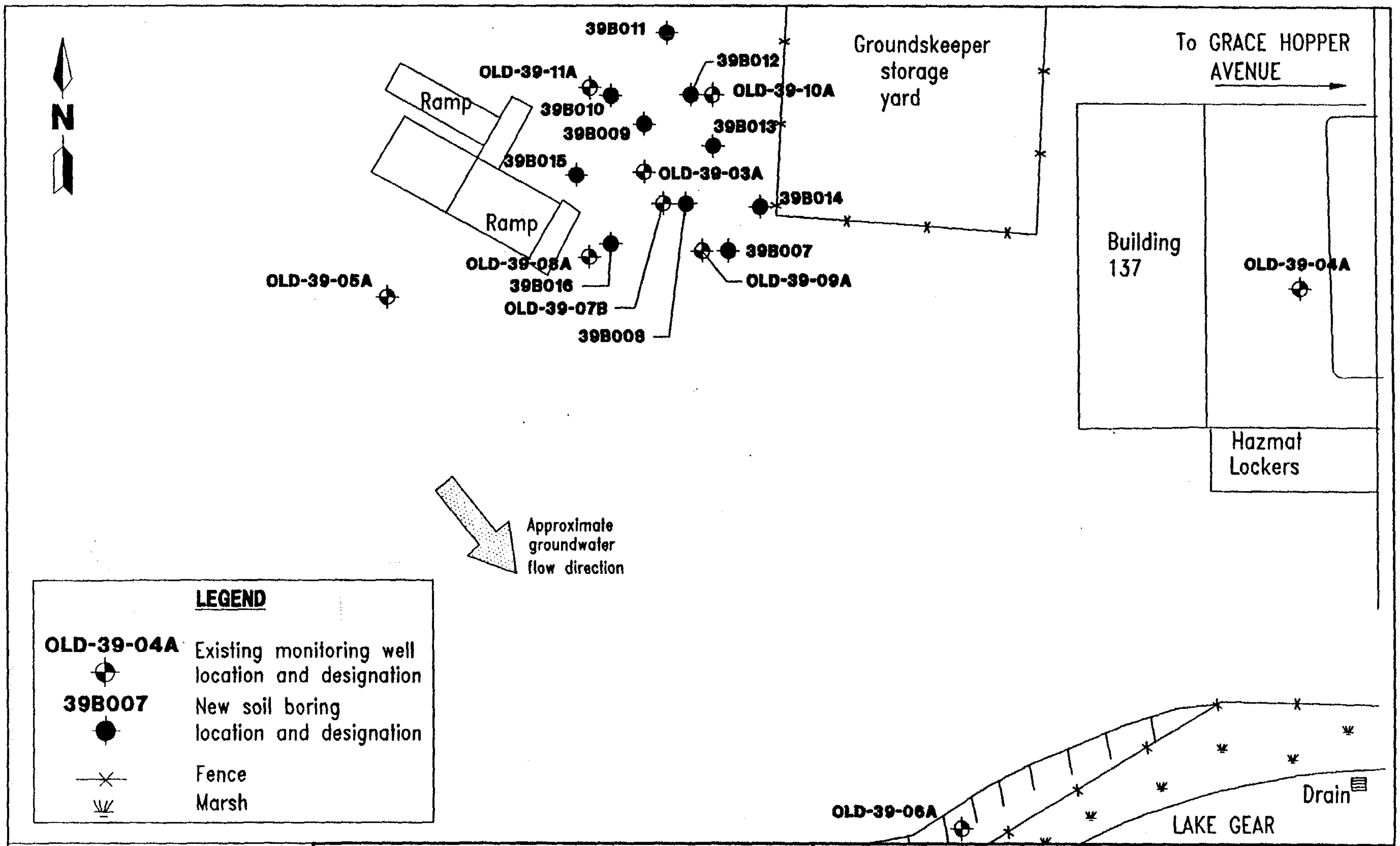

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FIGURE 4-3
SOIL BORING LOCATIONS

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4.2.1.4 Results

CPT. The data generated during the CPT survey indicate that the upper 30 feet of the shallow aquifer is composed of silt and sand-sized particles with limited percentages of clay and organic matter. In the east-central part of the investigation near Building 137, a hardpan layer of undetermined thickness exists at a depth of approximately 25 feet bls. The hardpan layer is composed of sandy clay and was identified during the first phase of supplemental screening. This layer was found throughout the investigation area. The upper surface of the clay slopes south and westward from the north and east sides of the investigation area. The clay layer thins across the area from a maximum thickness of over 3 feet in the northwest corner to less than 1 foot in the southeast corner. The thinning of the clay is accompanied by an increase in the percentage of sand within the unit. In the far southeast corner the unit grades to a clayey sand.

The material beneath the sandy clay is comparable to the upper part of the subsurface with a preponderance of sand and silt. This holds true to a depth of approximately 80 feet bls, where the shallowest clay within the Hawthorn Group was encountered. Physical data gathered during the CPT survey are presented in Appendix H.

Groundwater Screening Results from DPT Samples. The only chlorinated hydrocarbon compounds detected during screening were PCE and TCE. PCE was detected at more locations and at significantly higher concentrations than TCE throughout the area of concern. TCE was only detected in 5 of the 158 samples analyzed onsite, at a maximum concentration 2.2 $\mu g/\ell$. PCE concentrations exceeded 50 $\mu g/\ell$ in 19 samples. A listing of the detections at the 30 screening points is presented in Appendix I, Table I-1, and the onsite analytical screening results of the onsite mobile field laboratory are provided in Appendix I, Table I-2.

The screening results define the general horizontal and vertical limits of the PCE plume. The geometry of the plume was measured at three key depth intervals: 15 to 17 feet bls, 28 to 30 feet bls, and 35 to 37 feet bls.

At 15 to 17 feet bls (approximately 3 to 4 feet below the water table), PCE detections extend from approximately 50 feet upgradient of the original hot well (OLD-39-03A) to a distance of approximately 200 feet downgradient from that point. At this interval, the plume is elliptical in plan view, and the long axis is oriented with the direction of groundwater flow (Figure 4-4). The maximum total PCE concentration at 15 to 17 feet bls was 38 $\mu g/\ell$ at screening point 39Q001, located 50 feet downgradient from OLD-39-03A. PCE was not detected at screening points placed along the southern property line (39Q010, 39Q012, 39Q016, and 39Q020) suggesting that the shallow portion of the plume does not exit base property.

The highest PCE concentrations were detected in samples collected from the 28- to 30-foot interval. At screening point 39Q014, a total PCE concentration of 234 $\mu g/\ell$ was detected at that interval. The plume at that interval is larger, extending from screening point 39Q003 to at least as far downgradient as 39Q022 (Figure 4-5). The absence of any PCE detections at screening points 39Q001, 39Q008, 39Q030, 39Q011, 39Q025, and 39Q029 defines the western and northern limits of the plume. The data fail to completely define the southern and eastern

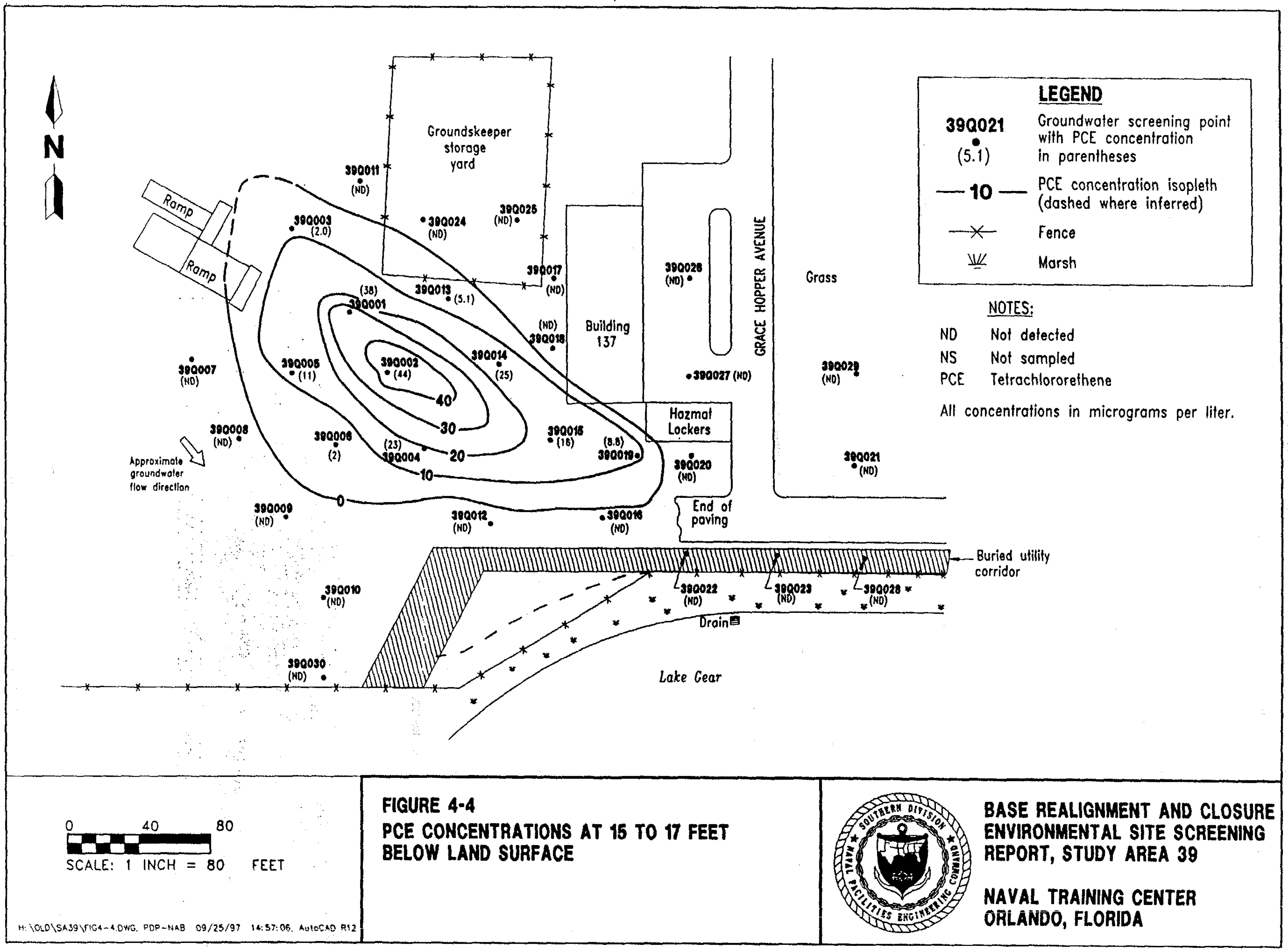

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FIGURE 4-4
PCE CONCENTRATIONS AT 15 TO 17 FEET BELOW LAND SURFACE

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

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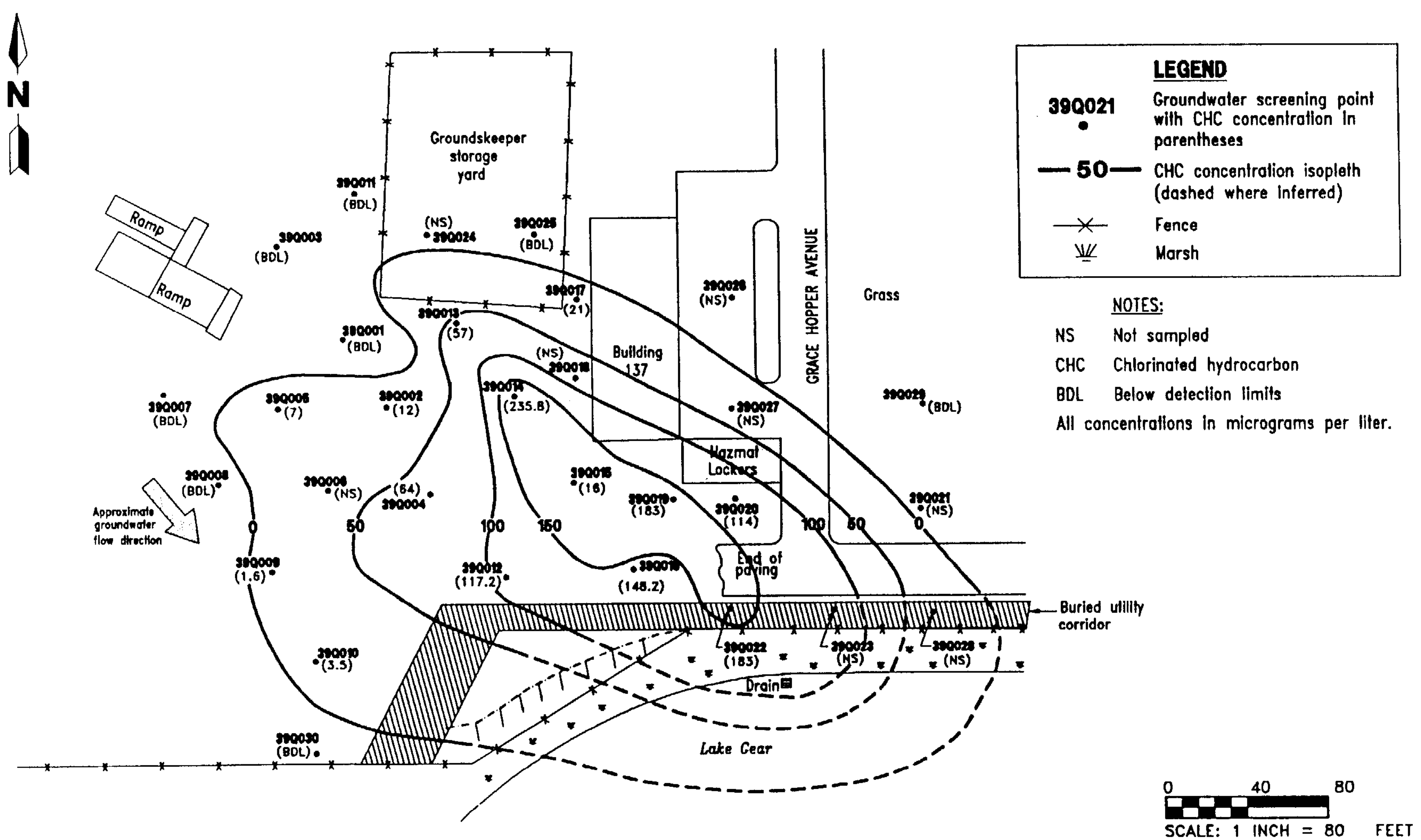


FIGURE 4-5
TOTAL CHLORINATED HYDROCARBON CONCENTRATIONS AT 28 TO 30 FEET BELOW LAND SURFACE

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

H:\OLD\SA39\ AND T:\8519-38\TM-SA39 KHM-NP-PDP 9-5-97 limits of the plume. Samples collected from the 28- to 30-foot bls interval at the three screening points placed near the southern property line (39Q012, 39Q016, and 39Q022) all had PCE concentrations exceeding regulatory criteria (116 µg/ℓ, 146 µg/ℓ, and 183 µg/ℓ, respectively).

The 35- to 37-foot interval is immediately below the clay layer (Figure 4-6). At that interval, the PCE plume is limited to the southeast corner of the site, below the area where the clay layer has higher sand content. The samples collected at screening points 39Q016, 39Q019, 39Q020, and 39Q022 were the only points with PCE detections. The PCE concentrations measured at those locations were 18 µg/ℓ, 6.2 µg/ℓ, 22 µg/ℓ, and 22 µg/ℓ, respectively. Samples were not collected deeper than 25 feet bls east of screening point 39Q022 because of refusal caused by the hardpan. Data gaps exist along the east and south sides of the plume at this interval and deeper.

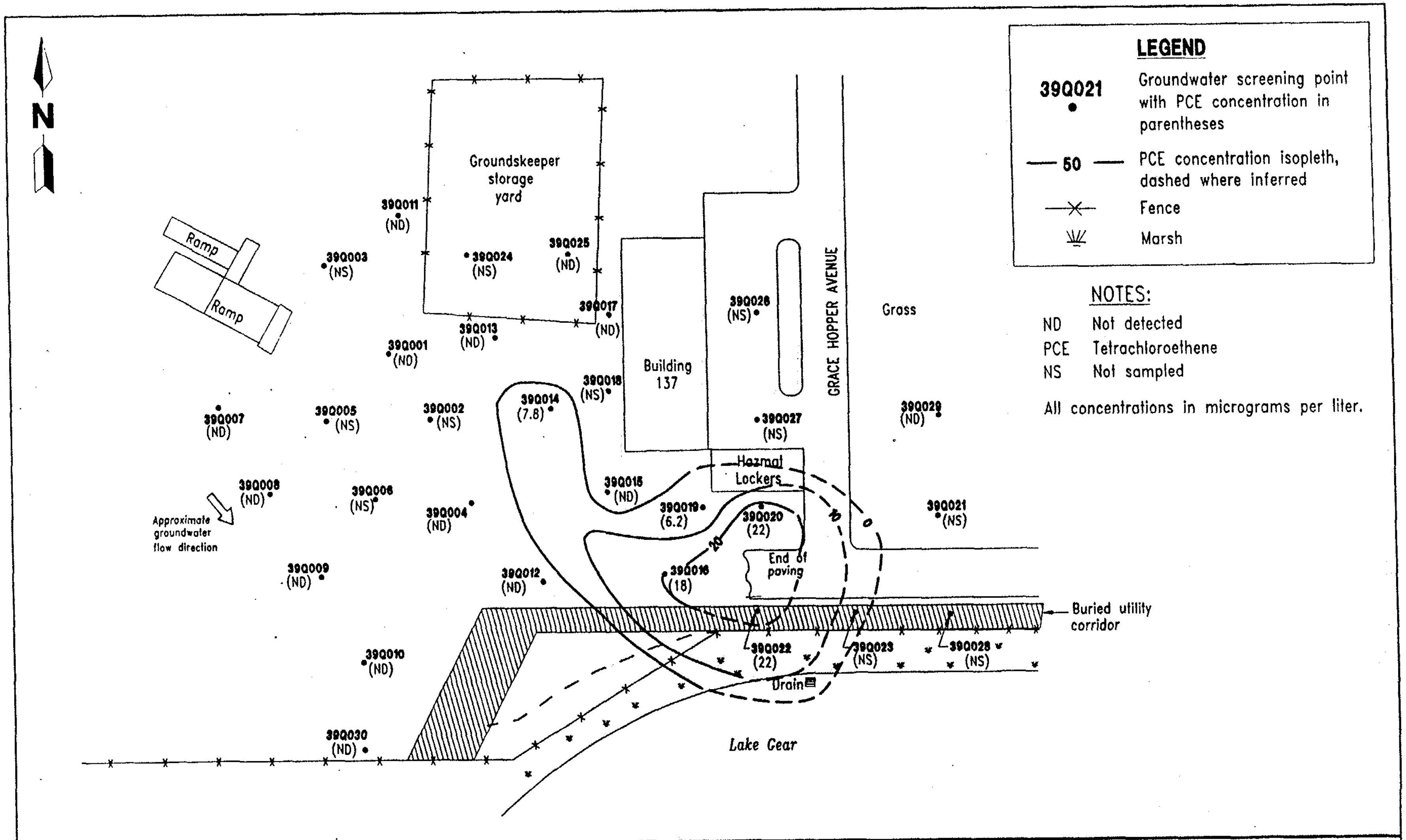
Below 37 feet bls, the only PCE detections were at screening points 39Q020 and 39Q022. At 39Q020, the PCE concentration detected at 40 to 41 feet was 228 µg/ℓ.

At 39Q022, the highest PCE concentration detected below 37 feet was at the 50- to 51-foot interval (46 µg/ℓ). No PCE was detected at 39Q022 at 70 to 71 feet bls.

Figure 4-7 presents a cross-section profile drawn through the long axis of the PCE plume along a line oriented parallel to groundwater flow. The cross section was constructed using results of the CPT survey and the onsite analytical data collected at screening points 39Q003, 39Q001, 39Q002, 39Q004, and 39Q022. As can be seen, the only affected groundwater at the water table was at screening point 39Q001. Downgradient from that point, the highest PCE concentrations were located along the upper surface of the sandy clay layer. PCE was not detected beneath the clay in the upgradient portion of the plume. In the downgradient portion of the plume where the clay thins and is coarser grained, the plume has apparently migrated through the clay in the vicinity of screening point 39Q022. The PCE plume extends to a depth of at least 60 feet bls at that location.

Twelve of the screening samples were submitted to an off-site laboratory for confirmation of the field screening results. Results from the off-site groundwater confirmation samples are provided in Appendices E (Summary of Detections) and F (Summary of Analytical Results). Results compare reasonable well, especially in samples with higher PCE concentrations. For example, in samples 39Q01404 and 39Q02006 where field screening results indicated PCE concentrations ranging from 228 to 243 µg/ℓ, the off-site laboratory reported values for both samples of 260 µg/ℓ. At lower concentrations of PCE, the off-site laboratory reported PCE concentrations ranging from 7 to 50 percent of the onsite field laboratory values.

Soil Screening. There were no detections of the PCE in the soil samples analyzed onsite with the field laboratory or in the confirmation samples analyzed off-site. The onsite laboratory soil analytical screening results are presented in Appendix I. The off-site confirmation analytical results are provided in Appendices E (Summary of Detections) and F (Summary of Analytical Results).



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SCALE: 1 INCH = 50 FEET

FIGURE 4-6
PCE CONCENTRATIONS AT 35 TO 37 FEET BELOW LAND SURFACE

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

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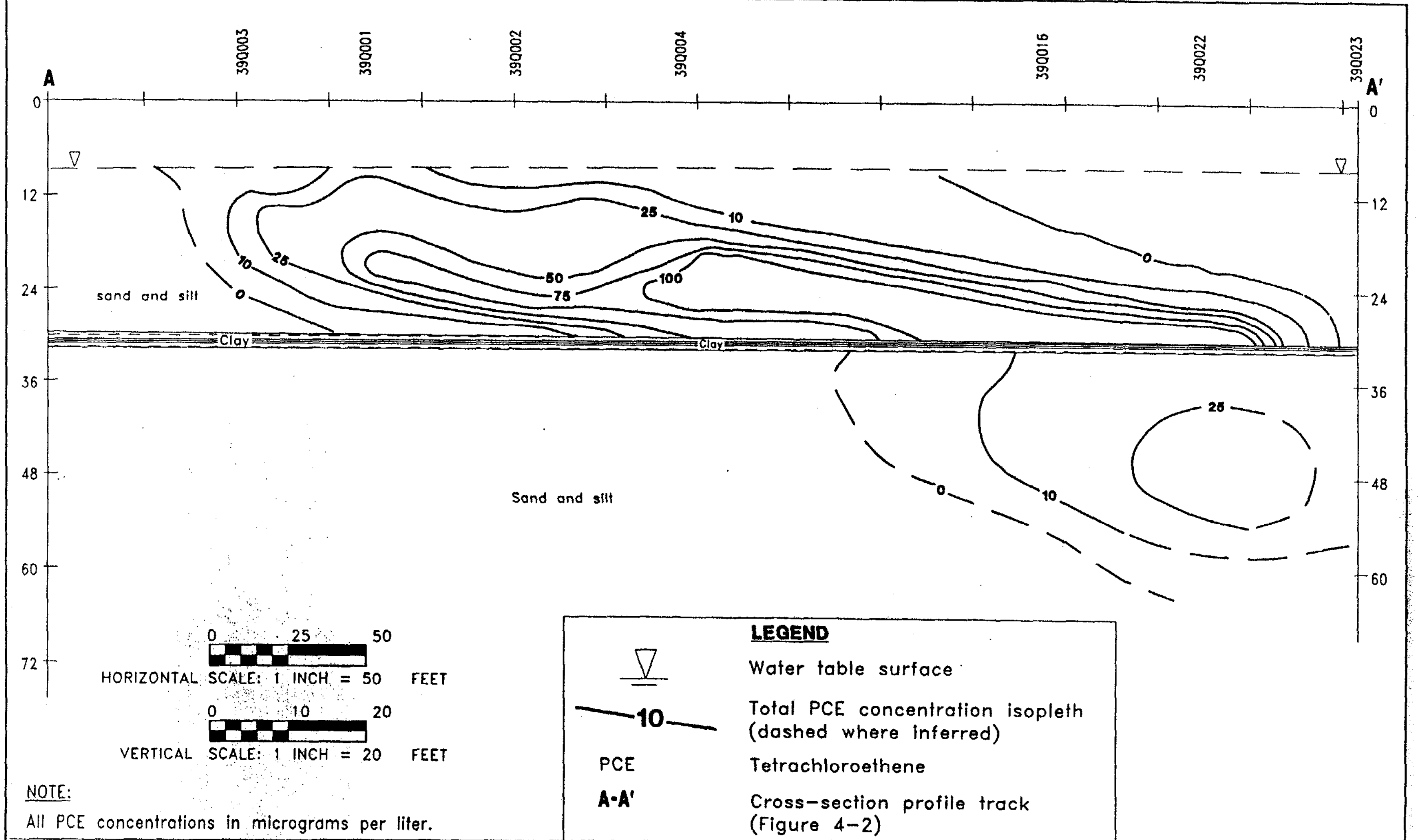

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FIGURE 4-7
PCE CONCENTRATION AND LITHOLOGIC CROSS SECTION A-A'

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

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4.2.2 Confirmation While the first objective for the second phase of this investigation was to map the PCE plume using DPT to screen a large number of groundwater samples, a second objective was to confirm those screening results. Accordingly, 15 new monitoring wells were installed during the investigation and were incorporated with 3 existing wells from earlier studies to form a network of 6 well clusters. Each cluster included a shallow well screened to bracket the water table, an intermediate well screened immediately above the shallow clay, and a deep well screened below the shallow clay. At each cluster the shallow well was placed upgradient of the intermediate and deep wells. The shallow wells were given an "A" designation, the intermediate wells a "B" designation, and the deep wells a "C" designation. The rationale and details of the monitoring well program are described below.

4.2.2.1 **Monitoring Well Placement and Construction** New monitoring wells OLD-39-12A, OLD-39-13B, and OLD-39-14C comprise a well cluster located approximately 50 feet upgradient from screening point 39Q003 (Figure 4-8). This cluster was placed upgradient of the trailing edge of the plume.

New monitoring well OLD-39-26C was combined with existing wells OLD-39-03A and OLD-39-07B to form a cluster located in the area with the highest PCE concentrations near the water table.

New wells OLD-39-15B and OLD-39-16C were combined with existing shallow well OLD-39-04A to form a cluster designed to verify the eastern limits of the plume.

New monitoring wells OLD-39-23A, OLD-39-24B, and OLD-39-25C were located at screening point 39Q030 and were designed to verify the western limits of the plume.

New wells OLD-39-20A, OLD-39-21B, and OLD-39-22C were designed to verify the highest PCE concentrations detected along the upper surface of the shallow clay and to verify the lateral limits of the plume at the water table. These wells were intended to be located approximately 30 feet northwest, but surface and subsurface obstructions forced the move to their eventual location.

The last cluster included new wells OLD-39-17A, OLD-39-18B, and OLD-39-19C. This cluster was placed at screening point 39Q022 and was designed to verify the highest PCE concentrations detected below the shallow clay layer during screening. The shallow well would also serve to verify the general location of the leading edge of the plume.

All of the shallow and intermediate wells were installed using 6-1/4-inch inside diameter hollow stem augers. The wells are constructed of 2-inch, Schedule 40, flush-jointed, threaded, PVC screen and riser. The wells are constructed with 0.010-inch screen. The shallow wells were constructed with 10 feet of screen, and the intermediate wells were constructed with 5 feet of screen.

The deep monitoring wells were constructed with an outer 6-inch-diameter PVC surface casing set into the shallow clay layer to minimize the potential for cross contamination during well construction. The construction details for all monitoring wells installed at SA 39 are presented in Appendix A, Table A-1.

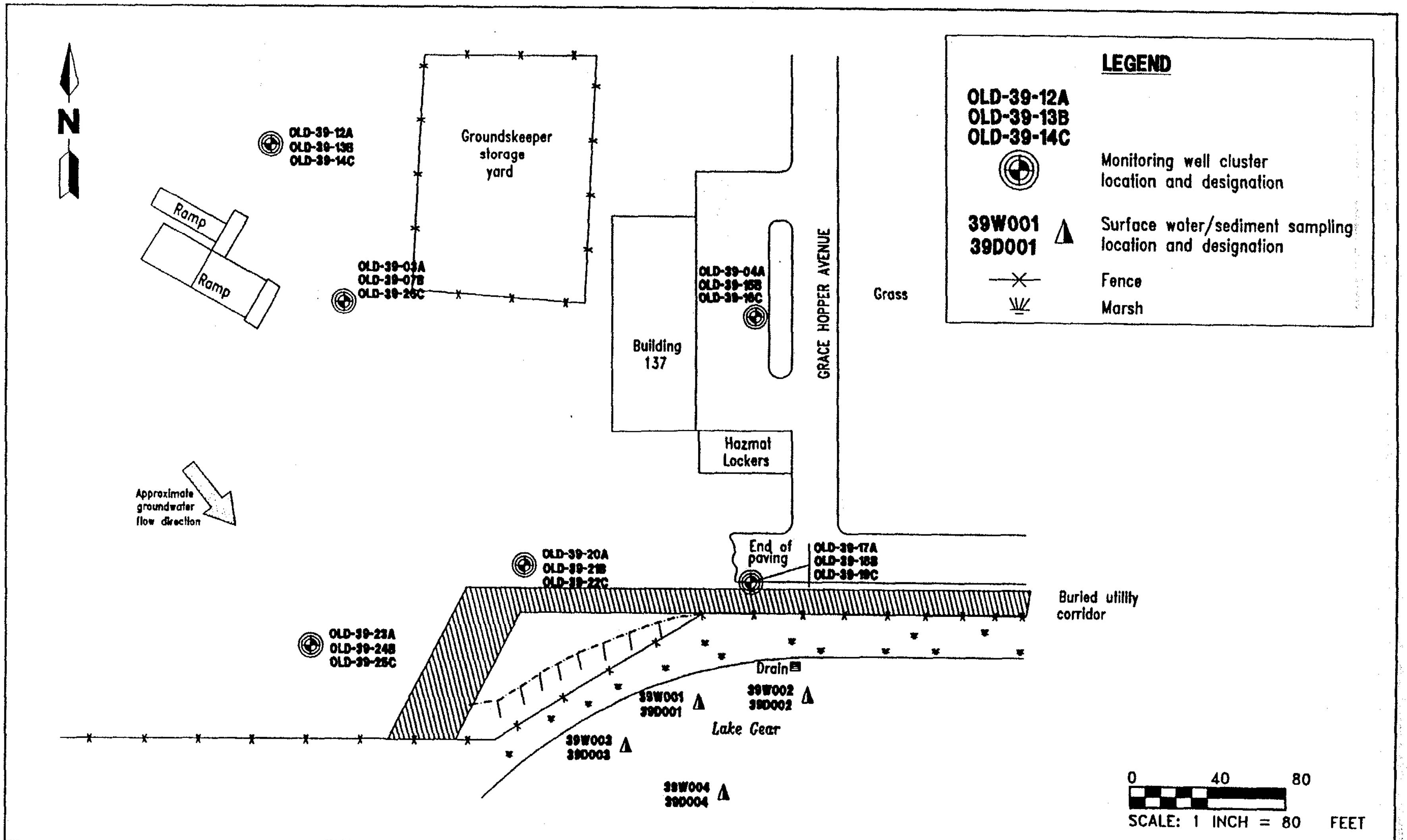

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FIGURE 4-8
GROUNDWATER, SURFACE WATER, AND SEDIMENT SAMPLING LOCATIONS

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

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The newly installed monitoring wells were developed to ensure proper setup of the filter pack. This was accomplished by pumping water from the well at varying rates to remove fine soil particles and to improve hydraulic connection with the surrounding aquifer. A minimum of three well volumes was purged from the wells,and purging continued until the turbidity was reduced as much as possible and the field measurements of turbidity, pH, temperature, and conductivity had stabilized.

Standard penetration testing (SPT) was performed at each monitoring well cluster to aid in the well design. Samples were collected continuously from the surface to the base of the surficial aquifer using a 2-foot-long, 1-1/2-diameter split-spoon sampler. Samples were classified using the USCS and screened with an FID. SPT results were combined with results of the CPT survey to construct a lithologic profile of the site.

4.2.2.2 **Groundwater Sampling** A groundwater sample was collected from each of 18 monitoring wells in 6 well clusters. Prior to sample collection, the wells were purged to ensure that groundwater representative of the surrounding aquifer was present in the well. The wells were purged using the low-flow method to minimize volatilization. A minimum of three well volumes was purged, and purging continued until the turbidity was reduced as much as possible and the field measurements of turbidity, pH, temperature, and conductivity stabilized. The collected samples were submitted to an off-site laboratory and analyzed for the presence of VOCs using USEPA Method 524.2.

Sampling for natural attenuation parameters was incorporated into the groundwater sampling program to provide a screening level assessment of natural attenuation as a remedial option for the chlorinated solvent contamination in the groundwater at SA 39. USEPA, Region IV (USEPA, 1997) recognizes that natural attenuation processes due to advection, adsorption, biological degradation, dispersion, and volatilization can effectively reduce contaminants to levels that are protective of human health and environment.

All of the 18 monitoring wells were sampled for most of the parameters listed in the draft Region IV guidance document, utilizing both field and laboratory methods. Field kits (obtained from the Hach Company) were utilized to measure total alkalinity, carbon dioxide, chloride, dissolved iron, dissolved iron (II), dissolved oxygen, and hydrogen sulfide. Oxidation-reduction potential, temperature, and pH were measured using field-based instruments. Groundwater samples were sent to an off-site laboratory for analysis of VOCs, ethane, ethene, methane, nitrate, nitrite, sulfate, sulfide, and total organic carbon.

Field data sheets associated with monitoring well installation and sampling during the Phase II supplemental work, including the soil boring logs, well construction diagrams, and the groundwater sampling data sheets, are provided in Appendix A.

4.2.2.3 **Surface Water and Sediment Sampling** Surface water and sediment samples were collected from four locations in Lake Gear (Figure 4-8) to evaluate the presence of PCE. Three surface water samples (38W001 through 39W003) were collected along the shoreline of Lake Gear where the water depth was 3 feet, whereas sample 39W004 was collected in approximately 10 feet of water. Surface water samples were collected at the midpoint between the water surface and the lake bottom. Prior to sample collection, the temperature, conductivity, pH, and turbidity of the water were measured and recorded. Sediment samples (39D001 to 004) were collected with stainless steel hand augers. Surface water and sediment samples were submitted to an off-site laboratory for analysis of VOCs as with groundwater and soil by USEPA Methods 524.2 and 8010, respectively.

4.2.2.4 **Hydraulic Conductivity Testing** *In situ* hydraulic conductivity tests were performed on selected monitoring wells installed during this investigation. Tests were performed at one shallow well (OLD-39-23A), two intermediate wells (OLD-39-21B and OLD-39-24B), and three deep wells (OLD-39-16C, OLD-39-22C, and OLD-39-25C). Additional shallow wells would have been tested, but the water table was near the lowest point in the yearly cycle, and, consequently, the water level was not high enough in other shallow wells to properly conduct the tests.

Before each test, a static water-level measurement was recorded after the well had equilibrated. A pressure transducer rated at 10 pounds per square inch was placed in the monitoring well to measure changes in water level during the test. The slug was then lowered into the well. After equilibrium was reached, the slug was removed swiftly from the well, and the rising head portion of the test was begun. The well was allowed to recover to 90 percent of static water level before the test was stopped.

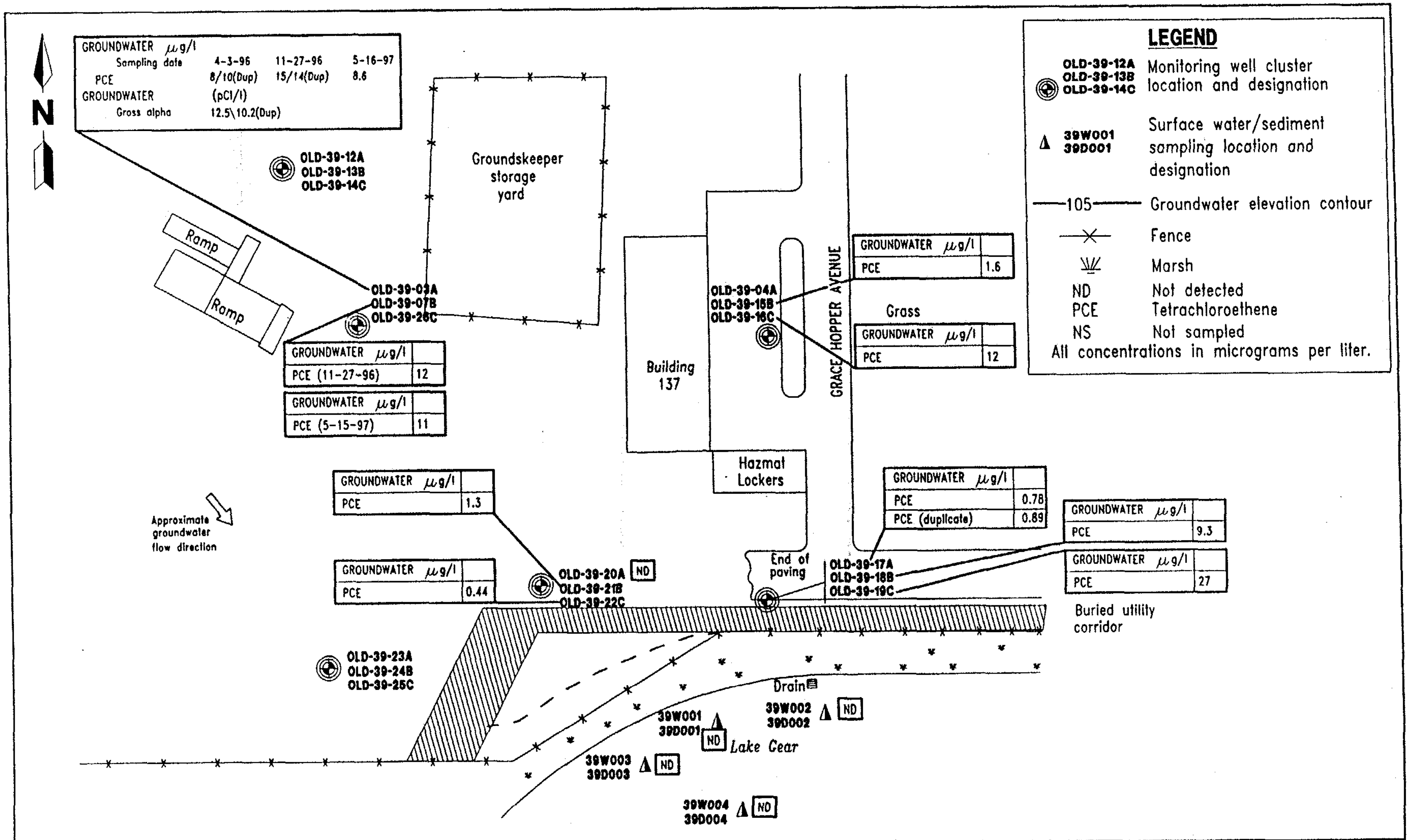
Data were processed in the Aqtesolv™ software program using the method of Bouwer and Rice (1976). For the well where the top of the screen was above the water table, the plot was analyzed using the double straight line method (Bouwer, 1989) to account for filter pack drainage.

4.2.2.5 **Results** The results of the supplemental groundwater screening investigation are presented below.

Groundwater Off-site Laboratory Analytical Results. Groundwater analytical results from the monitoring well program confirm the nature and extent of the PCE plume, as described above in Paragraph 4.2.1.4. PCE detections were noted at concentrations in excess of screening criteria at 8 of the 18 monitoring well locations.

Samples collected from the upgradient monitoring well cluster (OLD-39-12A, OLD-39-13B, and OLD-39-14C) showed no PCE detections (Figure 4-9). At the cluster located in the middle of the PCE plume, PCE was detected in shallow monitoring well OLD-39-03A at a concentration of 8.6 $\mu g/\ell$, while intermediate well OLD-39-07B had PCE at a concentration of 11 $\mu g/\ell$ and TCE at a concentration of 0.23 J (estimated) $\mu g/\ell$. There were no detections of VOCs in deep monitoring well OLD-39-26C.

Samples collected from the cluster installed to confirm the western limits of the plume (OLD-39-23A, OLD-39-24B, and OLD-39-25C) had no detections. Samples collected from the well cluster along the east side of the plume (OLD-39-04A, OLD-39-15B, and OLD-39-16C) showed no detections in the shallow well, but did have concentrations of volatiles in the intermediate and deep wells. PCE and TCE were detected in intermediate well (OLD-39-15B) at concentrations of 1.6 $\mu g/\ell$ and 0.21 $\mu g/\ell$, respectively. PCE and TCE were detected in deep well OLD-39-16C at concentrations of 12 $\mu g/\ell$ and 0.65 $\mu g/\ell$, respectively. The only detections in samples collected from the cluster installed along the southern boundary of the



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SCALE: 1 INCH = 50 FEET

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FIGURE 4-9
PCE CONCENTRATIONS AT 35 TO 37 FEET BELOW LAND SURFACE

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

plume (OLD-39-20A, OLD-39-21B, and OLD-39-22C) were in the intermediate well where PCE and TCE were detected at concentrations of 1.3 μg/ℓ and 0.44 μg/ℓ, respectively.

At the cluster installed in the area where the screening data had the highest PCE concentrations beneath the shallow clay, the sample collected from the shallow well (OLD-39-17A) had a PCE concentration of 2 μg/ℓ. The sample collected from the intermediate well (OLD-39-18B) had PCE and TCE concentrations of 9.3 μg/ℓ and 0.47 μg/ℓ, respectively. The sample collected from the deep well (OLD-39-19C) had PCE and TCE concentrations of 27 μg/ℓ and 0.64 μg/ℓ, respectively. This sample also contained several other VOCs at concentrations below screening criteria, including 1,2,4-trimethylbenzene at 1.9 μg/ℓ and 1,3,5-trimethylbenzene at 1.9 μg/ℓ.

The groundwater analytical results from the Phase II investigation are provided in Appendices E (Summary of Detections) and F (Summary of Analytical Results).

Where comparative data exist, the DPT sampling results (field laboratory) compare favorably with the analytical data from monitoring wells (off-site CLP laboratory) (Table 4-1). There are 16 samples from which one may draw a direct comparison; i.e., samples were obtained from a similar depth interval and were collocated within 15 feet of each other. Nine of the 16 sample pairs reported nondetections or trace concentrations of PCE. Two monitoring wells (OLD-39-18B and -19C) had PCE concentrations of 9.3 and 27 μg/ℓ, versus field laboratory concentrations of 11 and 26 μg/ℓ in DPT samples 39Q02203 and 39Q02207, respectively. In addition, monitoring well OLD-39-03A had a PCE concentration of 8.6 μg/ℓ, versus a concentration of 38 μg/ℓ in DPT sample 39Q00101. There were also two samples with poor correlation: well OLD-39-07B reported a PCE concentration of 11 μg/ℓ, versus a nondetection of PCE in DPT sample 39Q00104, and well OLD-39-21B reported a PCE concentration of 1.3 μg/ℓ versus 66 μg/ℓ of PCE in DPT sample 39Q01203.

The differences in PCE concentrations measured in samples collected with DPT and monitoring wells screened at comparable intervals are probably attributable to the differences in the length of the sampling interval: the DPT samples were collected from a 1-foot-thick interval whereas monitoring well samples were obtained from a screened interval of either 5 or 10 feet. In this study, the correlation is sufficient to conclude that the analytical results support the plume geometry depicted on Figures 4-4 through 4-7. As with any sampling program, data gaps exist with the monitoring well results because of the limited number of monitoring wells installed.

<u>Soil Onsite Field Screening and Off-Site Laboratory Analysis</u>. Surface and subsurface samples were located above the highest PCE concentrations at the water table surface. Ten soil borings were hand-augered at these locations, and samples were collected representing each 2-foot interval between the surface and the water table. All samples were analyzed for VOCs with an onsite GC, and 20 percent of the samples were sent off-site for confirmation. There were no detections of PCE in surface or subsurface soil samples for either onsite or off-site laboratory analysis.

<u>Natural Attenuation Sampling and Analysis</u>. Analytical results for the various natural attenuation parameters are presented in Appendix J, Table J-1. Preliminary screening scores were calculated using a point system presented in

Table 4-1
Comparison of Groundwater Analytical Results DPT (Onsite Field Laboratory) versus Monitoring Well (Off-Site CLP Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Monitoring Well ID	Screened Interval (ft bls)	PCE Concentration ($\mu g/\ell$) (CLP laboratory)	Nearest DPT Screening Point[1]	DPT Sampling Interval[2] (ft bls)	PCE Concentration ($\mu g/\ell$) (field laboratory)
OLD-39-03A	6 to 16	8.6	39Q00101	15 to 17	38.0
OLD-39-07B	27 to 32	11	39Q00104	30 to 32	<2
OLD-39-26C	35 to 40	<0.5	39Q00105	36 to 37	<2
OLD-39-12A	6 to 16	<0.5	39Q00301	20 to 22	2.0
OLD-39-13B	23 to 28	<0.5	39Q00302	25 to 27	<2
OLD-39-14C	35 to 40	<0.5	NA[3]	--	-
OLD-39-04A	5 to 15	<0.5	39Q02701	15 to 16	<2
OLD-39-15B	19 to 24	1.6	39Q02702	20 to 21	4.2
OLD-39-16C	35 to 40	12	NA[3]	--	-
OLD-39-17A	6 to 16	0.78/0.89 (Dup)	39Q02201	15 to 16	<2
OLD-39-18B	23 to 28	9.3	39Q02203	25 to 26	11
OLD-39-19C	45 to 50	27	39Q02207	45 to 46	26
OLD-39-20A	6 to 16	<0.5	39Q01201	15 to 16	<2
OLD-39-21B	23 to 28	1.3	39Q01203	25 to 26	66
OLD-39-22C	35 to 40	0.44J/0.46J (Dup)	39Q01205	35 to 36	<2
OLD-39-23A	6 to 16	<0.5	39Q03001	15 to 16	<2
OLD-39-24B	23 to 28	<0.5	39Q03003	25 to 26	<2
OLD-39-25C	35 to 40	<0.5	39Q03005	35 to 36	<2

[1] Monitoring well clusters were installed within 5 feet of the screening point listed except for the OLD-39-20A/OLD-39-21B/OLD-39-22C and OLD-39-23A/OLD-39-24B/OLD-39-25C clusters, which were placed approximately 15 feet from the nearest screening point.
[2] DPT sampling interval shown is that interval which best corresponds to the screened interval of the cited monitoring well. In each instance the DPT sampling interval is situated within the screen's depth interval.
[3] NA indicates that there was no DPT sampling interval which corresponded with the monitoring well's screened interval.

Notes: DPT = direct-push technology.
CLP = Contract Laboratory program.
ID = identifier.
ft bls = feet below land surface.
PCE = tetrachloroethene.
$\mu g/\ell$ = micrograms per liter.
< = less than.
NA = not applicable.
-- = not available.
Dup = Duplicate sample.
J = estimated value.

the Draft Region IV Approach to Natural Attenuation of Chlorinated Solvents (USEPA, 1997) and are presented in Table J-2 (Appendix J).

Existing data appear to show that natural attenuation resulting from biological degradation is currently not a significant factor for this site, with screening scores for all wells ranging from 4 to 14 (versus a USEPA guidance value of 20 or greater), indicating inadequate to limited evidence that biological degradation is occurring. Limited biodegradation of PCE is further evidenced by the absence of degradation products (e.g., TCE, cis-DCE, and vinyl chloride) in any of the wells sampled. Total organic carbon in the groundwater appears to be a major limiting factor with low concentrations ranging from 1 to 20 milligrams per liter. Both the dissolved oxygen and the oxidation-reduction potential measurements show that the groundwater is currently aerobic, indicating that reductive dechlorination of PCE is limited.

<u>Surface Water and Sediment Analytical Results</u>. Samples collected at surface water and sediment locations in Lake Gear had no PCE detections (Figure 4-9). These results are consistent with the analytical results of shallow monitoring well samples collected from the three monitoring well clusters along the northern shoreline of Lake Gear. However, samples collected from the intermediate well OLD-39-18B and the deep well OLD-39-19C reported PCE concentrations of 9.3 and 27 $\mu g/\ell$.

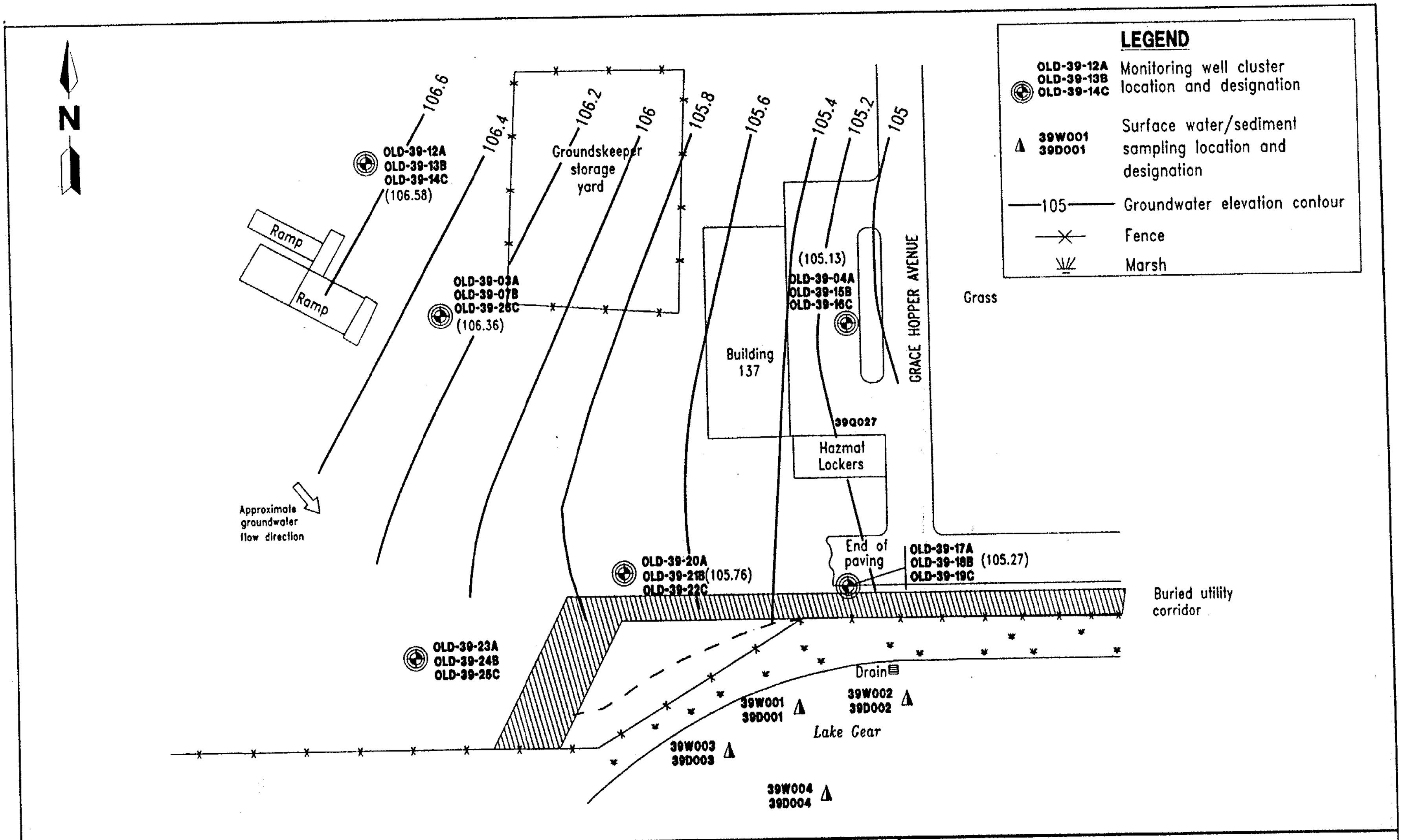
The surface water and sediment analytical results from the Phase II investigation are provided in Appendix F (Summary of Analytical Results).

<u>Groundwater Flow Rate and Plume Migration</u>. Data collected from the monitoring well network were utilized to determine the groundwater flow rate within the surficial aquifer in the area of the PCE plume. These data included results from hydraulic conductivity testing (discussed in Paragraph 4.2.2.4, above) and water-level elevations at each well. The water-level data (Appendix A, Table A-2) were used to calculate the horizontal gradient of the water table and the vertical potential (Appendix A, Table A-3) between the shallow and deeper portions of the surficial aquifer. The water-level data collected on July 25, 1997, are presented on Figures 4-10 through 4-12 as groundwater elevation contours for the shallow (i.e., water table), intermediate (up to 19 to 30 feet bls), and deep (35 to 50 feet bls) portions of the surficial aquifer, respectively. The horizontal gradient was then combined with the conductivity results to calculate the average linear velocity (or seepage velocity) using the following formula:

$$V = Ki/p \qquad (1)$$

where: V = groundwater flow velocity (feet per day),
K = hydraulic conductivity (feet per day),
i = hydraulic gradient (feet per foot), and
p = effective porosity (unitless, assumed at 0.30).

Hydraulic conductivity values ranging from 2.3 feet per day to 5.8 feet per day were calculated based on the slug test results (Appendix K). An average conductivity value of 4.1 feet per day was determined for six wells tested. The average value was combined with the measured water table gradient (0.0025 foot per foot, or 0.25 foot per 100 feet) to calculate groundwater flow rates across



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SCALE: 1 INCH = 80 FEET

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FIGURE 4-10
GROUNDWATER ELEVATION CONTOURS SHALLOW PORTION OF SURFICIAL AQUIFER
JULY 25, 1997

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

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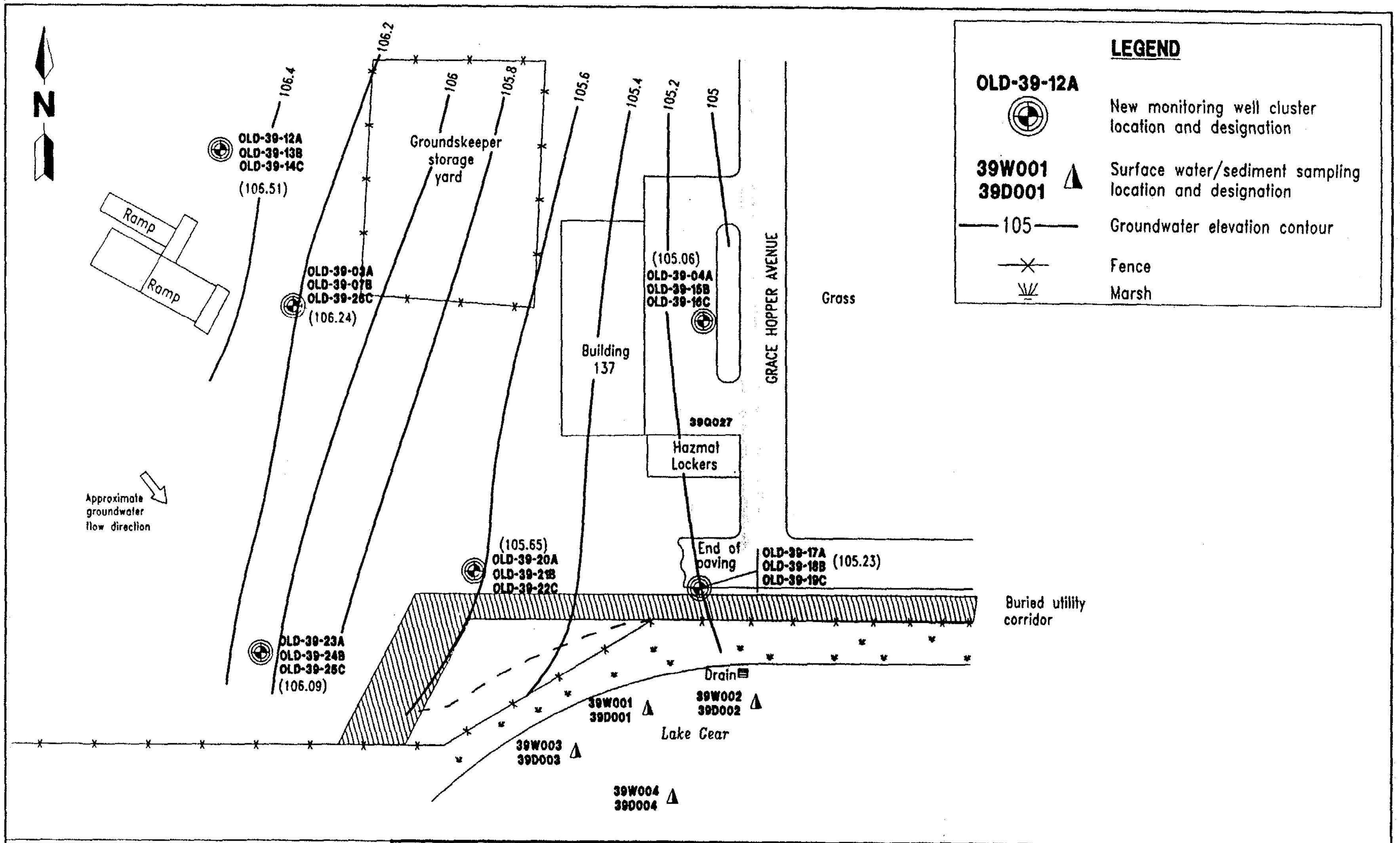

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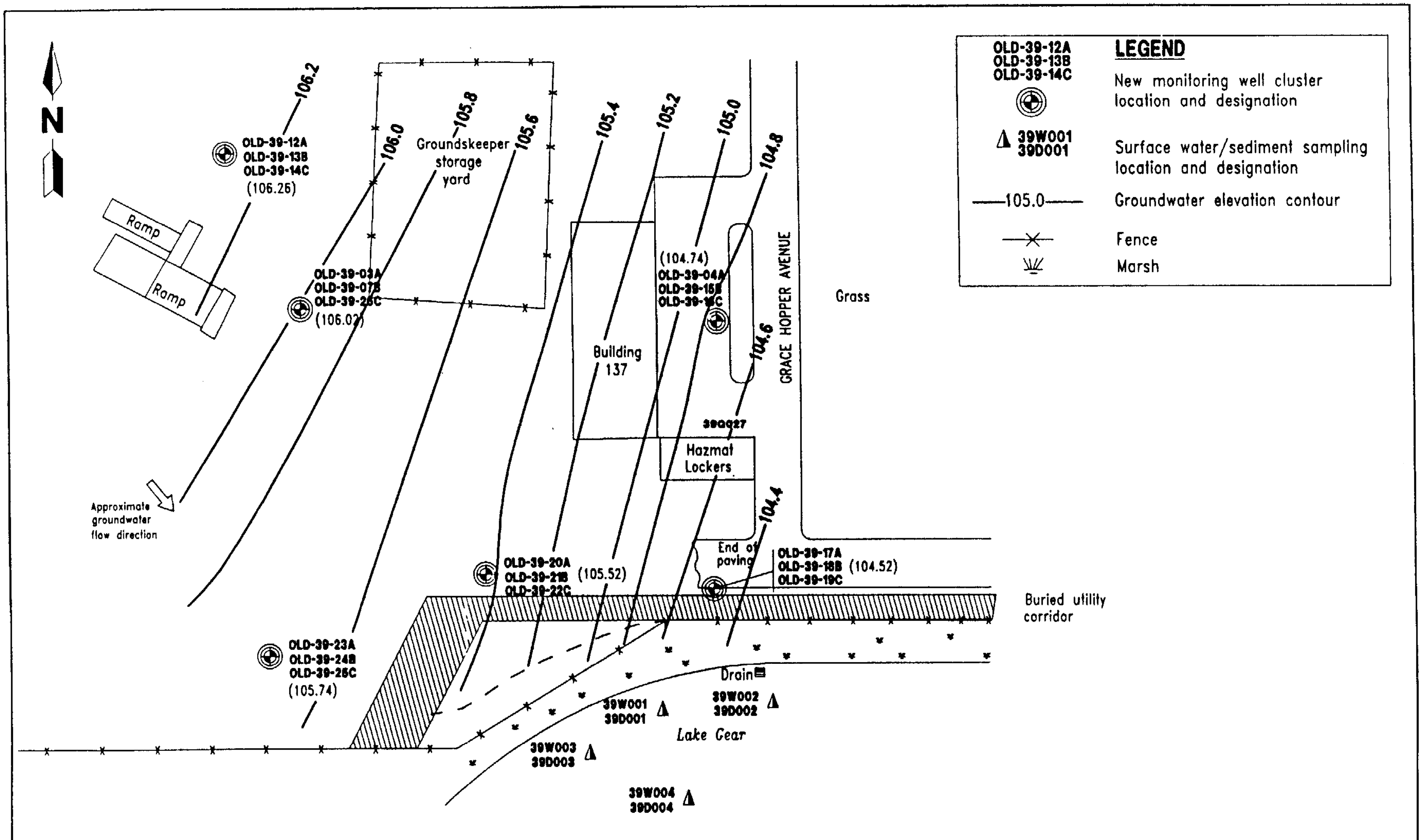
FIGURE 4-11
GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE PORTION OF SURFICIAL AQUIFER
JULY 25, 1997

BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING
REPORT, STUDY AREA 39

NAVAL TRAINING CENTER
ORLANDO, FLORIDA



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SCALE: 1 INCH = 50 FEET

H:\OLD\SA39\FIG4-12.DWG, PDP-NAB 09/26/97 14:24:23, AutoCAD R12

FIGURE 4-12
GROUNDWATER ELEVATION CONTOURS
DEEP PORTION OF SURFICIAL AQUIFER
JULY 25, 1997

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

the site. Velocities ranging from 0.019 foot per day to 0.048 foot per day were calculated for the six wells tested with an overall site average of 0.034 foot per day. This translates into an average linear velocity of approximately 12 to 13 feet per year.

Given the measured thickness of the surficial aquifer of approximately 80 feet as determined from the CPT survey results, a transmissivity value of 330 square feet per day was calculated. The permeability test semilog plots are provided in Appendix K.

If one combines the measured groundwater flow characteristics with the current configuration of the PCE plume, it is possible to deduce the general migration history for the plume. Since the area around monitoring well cluster OLD-39-03A/OLD-39-07B/OLD-39-26C was the area with the highest VOC concentrations at the water table surface, it is assumed to be the source area. This assumption is supported by the passive soil gas results during the initial phase of screening. The absence of any detections in the soil samples collected in this area suggests that the source(s), if still present, is of limited extent. However, the source may be continuing to produce vapors in the soil, as evidenced by the soil gas results, and may contribute to the groundwater plume through rainwater infiltration.

Another possible scenario is that the original source is no longer present due to dissolution and volatilization. PCE may have partitioned out of groundwater and onto organic carbon in saturated soil when groundwater concentrations were higher. At present, these VOCs may be slowly dissolving back into groundwater.

Another alternative is that the source is gone and all that remains of the plume is the low parts per billion PCE contamination defined by the monitoring well clusters.

If one assumes a source location as described above and an annual average horizontal groundwater flow rate of 12.4 feet, then the initial release of contaminants would most probably have occurred on the order of 20 years ago. This calculation does not take retardation into account, which could slow the flow rate by a factor of two or more. The contaminants would have migrated downward through the vadose zone and shallow portion of the aquifer, aided by slightly downward vertical potential until encountering the shallow sandy clay layer. Aided by the morphology and orientation of the upper surface of the clay unit and the direction of groundwater flow, the PCE plume migrated along the surface of the clay until it reached the area where the percentage of sand in the unit increases (in the vicinity of screening points 39Q020 and 39Q022). At that point, the contaminant plume would be permitted to migrate deeper, again along slightly downward vertical flow potential.

5.0 STUDY AREA 39, CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS. The soil and groundwater at SA 39 have been variably impacted by previous activities at the site. A summary by medium is presented below.

5.1.1 Soil The screening investigation results indicate that PAHs are present in the surface soil at concentrations greater than 1,000 $\mu g/kg$. Arsenic was also detected at concentrations exceeding its residential screening value. The results of the FRA conducted for this medium demonstrated that the potential future RME for residents exposed to surface soils at SAs 39 (and 40) were at a risk level of 1×10^{-5}, which slightly exceeds the cancer risk target established by the State of Florida, but which is within the target risk range established by the USEPA. The FRA also concluded that the potential future average residential risk posed by exposure to surface soil was at an acceptable cancer risk level of 1×10^{-6}.

The cancer risk range, 1×10^{-5} to 1×10^{-6}, presented by these scenarios presents information for the risk manager to use as perspective into the risks presented by the site as a whole. The risk manager should consider the risk reduction achieved by cleanup of arsenic and/or PAHs in surface soil. The reduction of arsenic to the RGO or the established NTC, Orlando background screening concentration of 1 mg/kg would result in a RME residential risk of 2.5×10^{-6}. Furthermore, remediation of PAHs to the RGO or the residential Florida SCTL would result in a risk level of 1.6×10^{-6}. The combined cancer risk of these compounds following remediation to RGOs is 4.1×10^{-6}. Thus, a risk reduction from 1×10^{-5} to 4.1×10^{-6} achieved through remediation would result in associated remediation costs ranging from approximately $500,000 and $1.6 million (ABB-ES, 1997d).

There has been a recent change in the projected reuse of this parcel from mixed office and residential to nonresidential. Under a nonresidential reuse scenario, concentrations of arsenic and PAHs in surface soil meet screening criteria. However, institutional controls in the form of land use restrictions would be necessary to protect future users.

5.1.2 Groundwater The results of the supplemental groundwater screening investigation indicated that dissolved PCE is present within the surficial aquifer at concentrations that exceed State and Federal MCLs. The elliptically shaped plume currently occupies an area extending from the solid waste receptacle storage area to immediately north of Lake Gear. Contaminants in the upgradient part of the plume are concentrated along the upper surface of a sandy clay layer approximately 30 feet bls. Further downgradient, the clay is thinner and coarser grained, and the plume has migrated downward to a depth of up to approximately 60 feet bls. The plume is not well-defined in the downgradient portion due to the presence of a utility corridor near the northern shoreline of Lake Gear.

Although data are limited, the downward vertical potential suggests that dissolved PCE may be migrating to deeper portions of the surficial aquifer. Downward vertical potential should disappear and become upward in the vicinity of Lake Gear. Screening data from DPT indicate that the leading edge of the plume is currently within approximately 50 feet of the northern shoreline of Lake Gear, although surface water and sediment samples indicate that the plume has not reached Lake Gear at detectable concentrations. The absence of any appreciable PCE daughter products indicates that PCE is not degrading at a significant rate, although other factors such as advection, adsorption, dispersion, and volatilization may be effective components of natural attenuation.

5.1.3 Site Conceptual Model The results of the supplemental groundwater screening investigation were used to develop a site conceptual model (SCM). The SCM is a framework within which the source area, release mechanism(s), and environmental pathways of potential concern are identified. The model is based upon our current understanding of the various environmental media and pathways. The model also serves as a framework for conceptualizing applicable remedial technologies and focusing activities toward an appropriate solution.

The source area is defined as the area where the release(s) of contaminants is suspected to have occurred. A contaminant release mechanism is a process that results in migration of a contaminant from a source area into the immediate environment, such as spills or leaks from a storage container. Once in the environment, contaminants can be transferred between media and transported away from the source and/or site.

The SCM developed for SA 39 is depicted on Figure 5-1. The source area is suspected to be the vicinity of the grounds maintenance storage yard and the waste receptacle loading ramps. The contaminant source release(s) mechanism is suspected to be occasional (or perhaps a single), low volume surface spills. The potential release pathway for contaminant migration is seepage into the subsurface through the soil and into the groundwater. Contaminants migrated along the pathway of groundwater flow, which is assumed to be primarily horizontal, until encountering a lens of sandy clay located at approximately 30 feet bls. Upon reaching the clay, the contaminants have migrated southeastward in the direction of groundwater flow toward Lake Gear. Near Lake Gear, the clay lens pinches out, thus allowing the contaminants to migrate downward to approximately 60 feet bls.

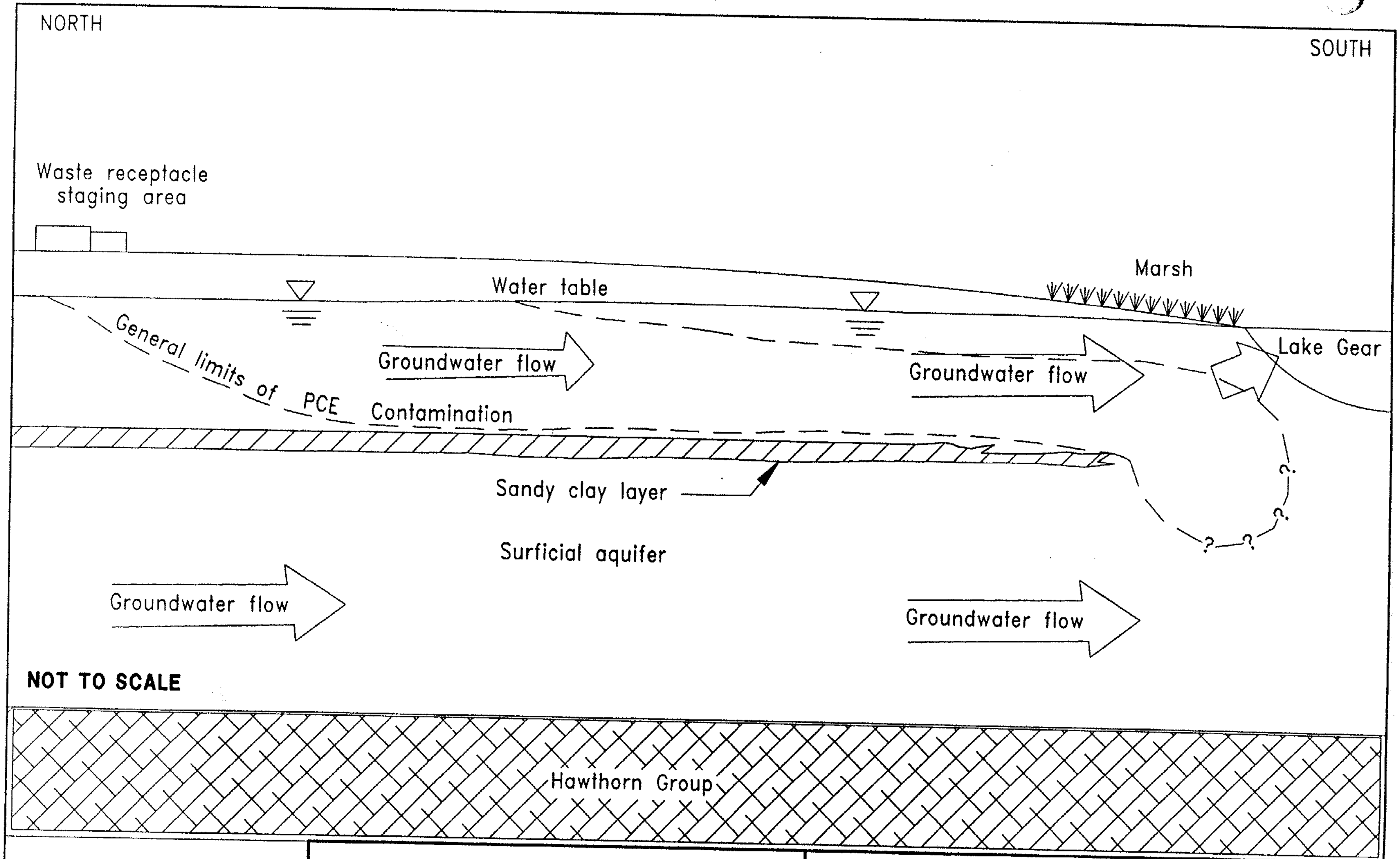
The downward component of vertical flow probably disappears and becomes slightly upward as groundwater approaches the northern shoreline of Lake Gear. The horizontal flow component is likely many times larger than any vertical (downward or upward) flow component. The only potential future exposure pathways of the chlorinated solvents are ingestion and inhalation of volatiles while showering.

5.2 RECOMMENDATIONS.

The results of the screening investigation warrant a reclassification of SA 39 from 7/Gray to 6/Red. Recommendations for the surface soil and groundwater at SA 39 are listed in the subsections below.

5.2.1 Soil Because of the recent change in reuse for this parcel from mixed office and residential to nonresidential, HLA recommends no further action for this medium. However, HLA recommends that institutional controls restricting this parcel to nonresidential use be implemented prior to transfer. These recommendations are consistent with the findings of the FRA (ABB-ES, 1997e).

5.2.2 Groundwater Due to PCE concentrations in groundwater that exceed State and Federal MCLs, HLA recommends that a risk analysis for groundwater be completed that would include data from all wells in the vicinity of the PCE plume. At the same time, an evaluation of remedial options and a cost benefit analysis should be completed.



LEGEND

PCE = Tetrachloroethene

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FIGURE 5-1
SITE CONCEPTUAL MODEL

BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

Seven monitoring wells at SA 39 were destroyed by the City of Orlando during recent utility construction activities along the south property line of the Main Base. The location and identifier of the destroyed wells are shown in Figure 5-2. HLA recommends that these wells be abandoned in accordance with applicable regulatory guidelines (if they can be located) and replaced so that they may be utilized in the groundwater monitoring effort.

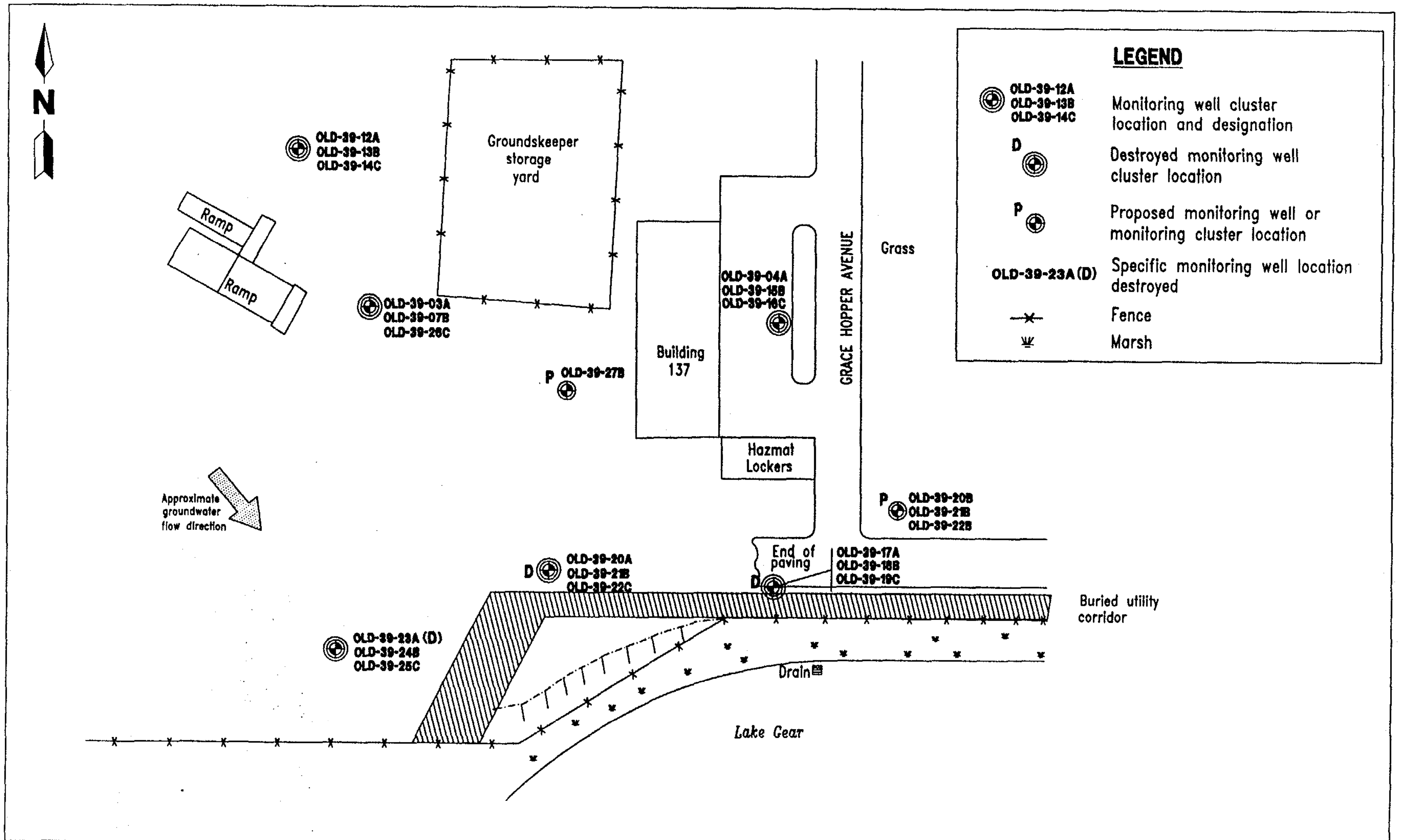
Given the configuration of the plume of contaminated groundwater, HLA also proposes that some of the wells be reinstalled at locations that would be more valuable for monitoring purposes. Monitoring well OLD-39-23A and the OLD-39-17A/OLD-39-18B/OLD-39-19C cluster can be installed at their original locations. The OLD-39-20A/OLD-39-21B/OLD-39-22C cluster, however, would better serve if moved to the open field immediately east of Grace Hopper Avenue and approximately 100 feet southeast of Building 137. The proposed replacement location of the monitoring wells is presented in Figure 5-2. Additionally, HLA would recommend that an intermediate-depth well be installed approximately 50 feet northwest of the southwest corner Building 137. This is the location of the highest PCE concentration (234 $\mu g/\ell$) detected in the intermediate depth range (28 to 30 feet bls) during the direct push technology screening investigation and would be valuable in monitoring any changes in the chemistry and movements of the contaminant plume. Following these activities, HLA also recommends that a quarterly groundwater monitoring program of selected wells be implemented. Quarterly monitoring (for volatiles and natural attenuation parameters would be reevaluated after 1 year.

HLA further recommends that a temporary groundwater use restriction be imposed for the shallow portion of the surficial aquifer pending results of the groundwater monitoring program.

The undersigned members of the OPT concur with the findings and recommendations of the preceding investigation.

STUDY AREA 39

Nancy Rodriguez	4/22/99
U.S. Environmental Protection Agency, Region IV	Date
David P. Grabka	4/22/99
Florida Department of Environmental Protection	Date
Wayne J. Hansel	4-22-99
U.S. Department of the Navy	Date



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SCALE: 1 INCH = 50 FEET

FIGURE 5-2
PROPOSED REPLACEMENT LOCATIONS FOR MONITORING WELL NETWORK

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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING REPORT, STUDY AREA 39

NAVAL TRAINING CENTER ORLANDO, FLORIDA

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ABB-ES. 1997d. *Cost Estimates for Surface Soil Remedial Options at Study Areas 39 & 40, Naval Training Center (NTC), Orlando, Florida.* Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina.

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APPENDIX A

SUMMARY OF MONITORING WELL CONSTRUCTION DETAILS, MONITORING WELL ELEVATION SURVEY, HEAD POTENTIAL ELEVATION SURVEY, SOIL BORING LOGS, INDIVIDUAL WELL CONSTRUCTION DETAILS, AND GROUNDWATER SAMPLING FIELD DATA SHEETS

Table A-1
Monitoring Well Construction Details

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Well ID[1]	Date Installed	Borehole Depth (feet bls)	Well Depth (feet bls)	Screen Interval (feet bls)	Filter Pack Interval (feet bls)	Seal Interval (feet bls)	Grout Interval (feet bls)	Casing Depth (feet bls)
Initial Screening:								
OLD-39-01A	3/19/96	16.5	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-02A	3/19/96	16.5	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-03A	3/20/96	16.5	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-04A	3/20/96	15.5	15	5 to 15	3 to 15.5	2 to 3	0 to 2	N/A
OLD-39-05A	3/20/96	15.5	15	5 to 15	3 to 15.5	2 to 3	0 to 2	N/A
OLD-39-06A[2]	4/22/96	10.5	10.5	5.5 to 10.5	4 to 10.5	--	--	--
Supplemental Screening (Phase I):								
OLD-39-07B	11/21/96	32.5	32	27 to 32	25 to 32	22 to 25	0 to 22	N/A
OLD-39-08A[3]	11/25/96	17	17	8 to 17	5 to 17	2.5 to 5	0 to 2.5	N/A
OLD-39-09A[3]	11/25/96	17	17	8 to 17	5 to 17	2.5 to 5	0 to 2.5	N/A
OLD-39-10A[3]	11/25/96	17	17	8 to 17	5 to 17	2.5 to 5	0 to 2.5	N/A
OLD-39-11A[3]	11/25/96	17	17	8 to 17	6 to 17	3.5 to 6	0 to 3.5	N/A
Supplemental Screening (Phase II):								
OLD-39-12A	4/21/97	17	16	6 to 16	4 to 17	2 to 4	0 to 2	N/A
OLD-39-13B	4/22/97	28.5	28	23 to 28	21 to 28.5	17 to 21	0 to 17	N/A
OLD-39-14C	5/1/97	40.5	40	35 to 40	33 to 40.5	29 to 33	0 to 29	0 to 31
OLD-39-15B	4/22/97	24.5	24	19 to 24	17 to 24.5	13 to 17	0 to 13	N/A
OLD-39-16C	5/3/97	40.5	40	35 to 40	33 to 40.5	29 to 33	0 to 29	0 to 25
OLD-39-17A	4/22/97	17	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-18B	4/23/97	28.5	28	23 to 28	21 to 28.5	17 to 21	0 to 17	N/A
OLD-39-19C	5/2/97	50.5	50	45 to 50	43 to 50.5	39 to 43	0 to 39	0 to 31
OLD-39-20A	4/21/97	16.5	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-21B	4/22/97	28.5	28	23 to 28	21 to 28.5	17 to 21	0 to 17	N/A
OLD-39-22C	5/2/97	40.5	40	35 to 40	33 to 40.5	29 to 33	0 to 29	0 to 31
OLD-39-23A	4/21/97	16.5	16	6 to 16	4 to 16.5	2 to 4	0 to 2	N/A
OLD-39-24B	4/22/97	28.5	28	23 to 28	21 to 28.5	17 to 21	0 to 17	N/A
OLD-39-25C	5/2/97	40.5	40	35 to 40	33 to 40.5	29 to 33	0 to 29	0 to 31
OLD-39-26C	5/1/97	40.5	40	35 to 40	33 to 40.5	29 to 33	0 to 29	0 to 30.5

See notes at end of table.

Table A-1 (Continued)
Monitoring Well Construction Details

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

[1] A, B, and C suffixes denote shallow, intermediate, and deep wells, respectively.
[2] Denotes a temporary monitoring well, installed with stainless steel hand auger.
[3] Denotes a microwell, installed by direct-push methods.

Notes: All permanent monitoring wells (excluding microwells) constructed with 2-inch-diameter PVC riser and screen (01-inch slot), and installed in a 6.5-inch-diameter borehole. Temporary monitoring well constructed with 2-inch-diameter PVC riser and screen (01-inch slot), and installed in a 3-inch-diameter borehole. Microwells constructed with 1-inch-diameter PVC riser and screen (01-inch slot), and installed in 2-inch-diameter borehole.

ID = identification.
bls = below land surface.
N/A = no surface casing utilized in construction.
PVC = polyvinyl chloride.
-- = not available.

Table A-2
Monitoring Well Elevation Survey

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Well Identifier	Horizontal Coordinates[1]		Top-of-Casing Elevation (feet msl)	Depth to Water (feet)		Water Elevation (feet msl)	
	Northing	Easting		7/9/97	7/25/97	7/9/97	7/25/97
OLD-39-12A	1535721.03	549637.86	117.92	12.15	11.34	105.77	106.58
OLD-39-13B	1535716.26	549638.03	117.74	11.92	11.23	105.82	106.51
OLD-39-14C	1535711.81	549638.42	117.73	12.03	11.47	105.70	106.26
OLD-39-03A	1535661.37	549665.12	116.76	11.22	10.40	105.54	106.36
OLD-39-07B	1535650.86	549671.94	116.90	11.50	10.66	105.40	106.24
OLD-39-26C	1535646.65	549676.23	116.66	11.21	10.64	105.45	106.02
OLD-39-04A	1535615.39	549865.44	115.16	11.00	10.03	104.16	105.13
OLD-39-15B	1535610.90	549865.25	115.13	10.96	10.07	104.17	105.06
OLD-39-16C	1535606.19	549865.16	115.09	11.04	10.35	104.05	104.76
OLD-39-20A	1535506.69	549735.61	117.56	12.74	11.80	104.82	105.76
OLD-39-21B	1535503.55	549731.57	117.61	12.74	11.90	104.87	105.71
OLD-39-22C	1535500.04	549727.15	117.70	12.74	12.18	104.96	105.52
OLD-39-23A	1535479.22	549646.59	116.73	11.38	10.61	105.35	106.12
OLD-39-24B	1535475.92	549649.60	116.54	11.21	10.45	105.33	106.09
OLD-39-25C	1535471.59	549653.49	116.32	11.11	10.58	105.21	105.74
OLD-39-17A	1535502.12	549849.97	116.42	11.87	11.15	104.55	105.27
OLD-39-18B	1535502.01	549854.42	116.41	11.89	11.18	104.52	105.23
OLD-39-19C	1535502.29	549860.22	116.38	12.41	11.86	103.97	104.52

[1] U.S. Geological Survey, North American Datum, 1927.

Note: msl = mean sea level.

Table A-3
Head Potential Elevation Survey

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Well Identifier	Water Level Elevation (feet msl)		Head Potential Measurements (feet)			
			July 7, 1997		July 25, 1997	
	July 9, 1997	July 25, 1997	Vertical Gradient[1] (ft/ft)	Direction of Groundwater Flow[2]	Vertical Gradient (ft/ft)	Direction of Groundwater Flow
OLD-39-12A	105.77	106.58				
OLD-39-13B	105.82	106.51	0.003	Downward	0.013	Downward
OLD-39-14C	105.70	106.26				
OLD-39-03A	105.54	106.36				
OLD-39-07B	105.40	106.24	0.008	Downward	0.014	Downward
OLD-39-26C	105.45	106.02				
OLD-39-04A	104.16	105.13				
OLD-39-15B	104.17	105.06	0.004	Downward	0.015	Downward
OLD-39-16C	104.05	104.74				
OLD-39-20A	104.82	105.76				
OLD-39-21B	104.87	105.71	0.006	Upward	0.010	Downward
OLD-39-22C	104.96	105.52				
OLD-39-23A	105.35	106.12				
OLD-39-24B	105.33	106.09	0.006	Downward	0.015	Downward
OLD-39-25C	105.21	105.74				
OLD-39-17A	104.55	105.27				
OLD-39-18B	104.52	105.23	0.016	Downward	0.021	Downward
OLD-39-19C	103.97	104.52				
Average:			0.007		0.015	

[1] Calculated by dividing the difference in the water-level elevation between the shallow and deep monitoring wells by the difference in the vertical distance between center point of screened interval of each well.
[2] Direction of groundwater flow as determined by difference in head potential.

Notes: msl = mean sea level.
ft/ft = feet per foot.

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-01
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: GPI	**Date started:** 03/19/96	**Compltd:** 03/19/96
Method: HSA	**Casing Size:** 10 in. OD	**Screen Int.:** 10 ft.
Protection level: D		
Ground Elev.:	**Type of OVM.:** Porta FID II	**Total depth:** 16Ft.
Dpth to ∇ 11 Ft.		
Logged by: WDO	**Material:** PVC	

Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
	39B00101 0-1' CLP				Asphalt/limerock subgrade			
				0	Fine SAND, off-white, subrounded, loose, dry to 11 ft.		SP	Posthole
				0				3,6,8,9
5			80%					
				0				4,4,8,9
			80%					
	39B00102 8-10' CLP			0				5,7,10,12
			70%					
10				0				8,7,6,8
			80%					∇
				0				8,10,12,13
			90%		Fine SAND with silt, dark brown		SM	
				0				6,8,14,13
15			100%					
					Boring terminated at 16 feet bgs			
20								

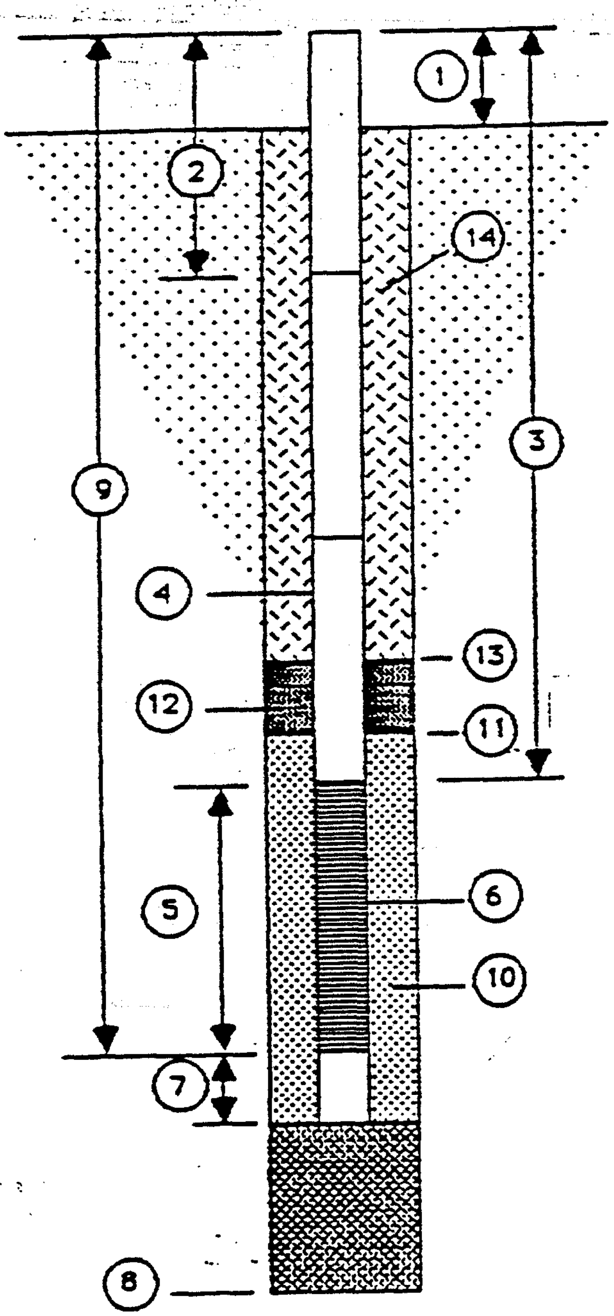
 ABB ENVIRONMENTAL SERVICES, INC.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER CLC-39-01

DATE OF INSTALLATION 3/10/96



1. Height of Casing above ground Flush
2. Depth to first Coupling 6' GLS

   Coupling Interval Depths 6. 16

3. Total Length of Blank Pipe 6'
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 10'
6. Type of Screen 0.010 Slot Screen
7. Length of Sump 6"
8. Total.Depth of Boring 16.5' Hole Diameter 8"
9. Depth To Bottom of Screen 16'
10. Type of Screen Filter 20/30 Silica Sand

    Quantity Used 500 lbs Size 20/30 U/C

11. Depth To Top of Filter 3' 3-6' 30/65 Sand
12. Type of Seal Bentonite

    Quantity Used 25 lbs.

13. Depth To Top of Seal 2 1/2'
14. Type of Grout Portland

    Grout Mixture Bentonite

    Method of Placement Poured

COMMENTS ON INSTALLATION:

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Project Number: 08519.10
Sample Location ID: OLD-39-01
Time: Start: 0905 End: 1145

Point of Interest: SA 39
Date: ~~4-16-96~~ 4-2-96 WDO
Signature of Sampler: William D. Olson

Water Level/Well Data

Well Depth 16.11 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up (from ground) FM Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 10.34 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 5.77 Ft. X ✓ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = [0.92 Gal/Vol; 10 Total Gal Purged]

Well Integrity:	Yes	No
Prot. Casing Secure	✓	
Concrete Collar Intact	✓	
Other ___		

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

(✓ If Used For)

Decontamination Fluids Used:

(✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Colored ___ Clear ___ Odor X Cloudy

Purge Data	@ Ø Gal.	@ 8.5 Gal.	@ 9.0 Gal.	@ 9.5 Gal.	@ 10 Gal.
Temperature, Deg. C	21.5	22.5	23.0	23.0	23.0
pH, units	5.59	6.16	6.20	6.17	6.17
Specific Conductivity	120	135	152	158	160
Turb ~~(umhos/cm. @ 25 Deg. C)~~	28.3	109.1	101.3	100.7	96.4
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL	3x40 ml	✓	
SVOA		4OC	2L	✓	
Pest/PCB		4OC	2L	✓	
Inorganics	~~Yes~~	HNO_3	1L	✓	
Explosives		4°C	2 x 1L	✓	
TPH		H_2SO_4			
TOC		H_2SO_4			
Nitrate		H_2SO_4			

Notes:

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-02
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: GPI	**Date started:** 03/19/96	**Compltd:** 03/19/96
Method: HSA	**Casing Size:** 10 in. OD / **Screen Int.:** 10 ft.	**Protection level:** D
Ground Elev.:	**Type of OVM.:** Porta FID II / **Total depth:** 16Ft.	**Dpth to** ▽ 11 Ft.
Logged by: WDO	**Material:** PVC	

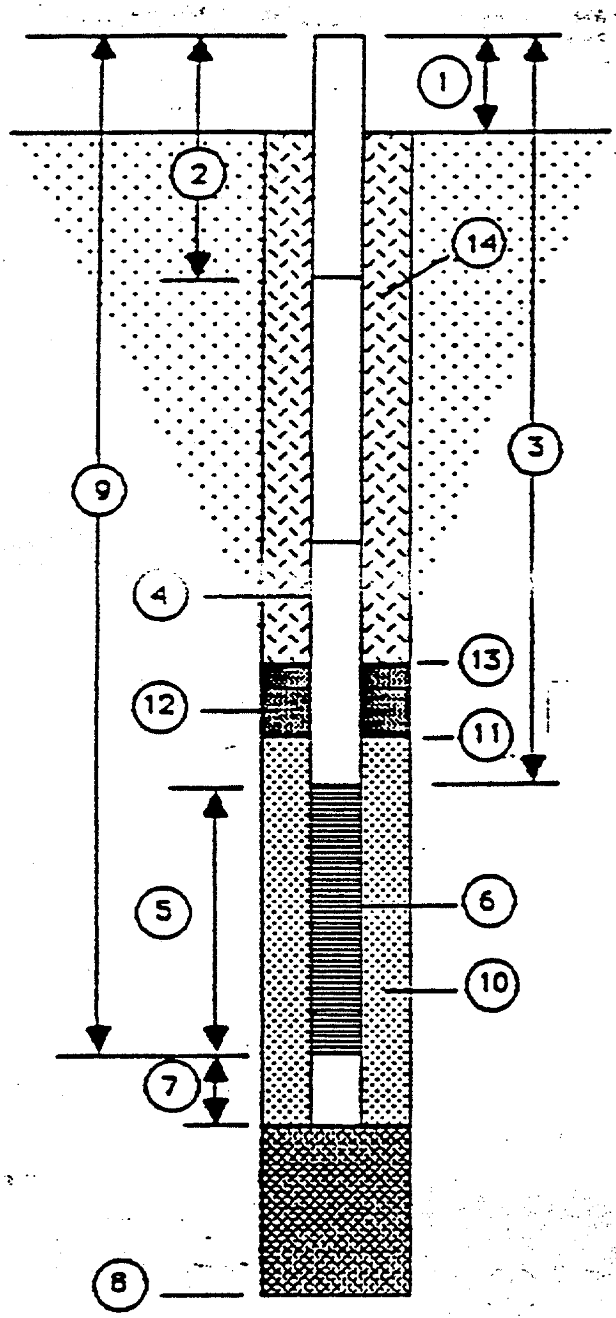
Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
0	39B00201-D,MS/MSD 0-1' CLP				Limerock/gray gravelly fill			
2				0	Fine SAND, off-white, loose, dry, subrounded, trace brown silt as mottling, silty layer at 8-8.5'		SP	Posthole
4			90%	0				2,4,6,8
6			70%	0				6,7,9,12
8	39B00202 8-10' CLP		70%	0				9,6,5,6
9					Silty SAND, dark brown, cohesive		SM	
10			100%	0	Fine SAND, off-white		SP	9,8,7,11
11					Silty SAND, brown		SM	
12			100%	0				4,5,5,16
14			100%	0				5,12,25,38
16					Boring terminated at 16 feet bgs			
20								

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OLC-39-02

DATE OF INSTALLATION 3/19/92



1. Height of Casing above ground Flush
2. Depth to first Coupling 6' BLS

   Coupling Interval Depths 6' - 16'

3. Total Length of Blank Pipe 6'
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 10'
6. Type of Screen 0.010 Slot Screen
7. Length of Sump 6"
8. Total Depth of Boring 16.5' Hole Diameter 8"
9. Depth To Bottom of Screen 16'
10. Type of Screen Filter 20/30 Silica Sand

    Quantity Used 500 lb Size 20/30 U/C

11. Depth To Top of Filter 3' 3-6' 30/65 Sand
12. Type of Seal Bentonite

    Quantity Used 50 lb

13. Depth To Top of Seal 2 1/2'
14. Type of Grout Portland

    Grout Mixture Bentonite

    Method of Placement Pour

COMMENTS ON INSTALLATION:

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Project Number: 08519.10
Sample Location ID: OLD-39-02
Time: Start: 1218 End: 1425

Point of Interest: SA 39
Date: 4-2-96
Signature of Sampler: William D. Olson

Water Level/Well Data

Well Depth 16 Ft. ___ Measured ✓ Historical ✓ Top of Well ___ Top of Protective Casing

Well Riser Stick-up (from ground) FM Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 9.96 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 6.04 Ft. X ✓ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.) = 0.96 Gal/Vol; 3 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	✓	
Concrete Collar Intact	✓	
Other ___		

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling	(✓ If Used For)	Equipment ID
✓	✓	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
✓	✓	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ Ø Gal.	@ 1.5 Gal.	@ 2.0 Gal.	@ 2.5 Gal.	@ 3 Gal.
Temperature, Deg. C	23.5	23.5	23.5	23.0	23.0
pH, units	4.57	4.49	4.48	4.49	4.50
Specific Conductivity	800	750	720	750	710
TURB ~~(umhos/cm @ 25 Deg. C)~~	16.98	7.76	4.61	3.18	2.08
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements (✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL	3x40ml	✓	/ / /
SVOA		4OC	2L	✓	/ / /
Pest/PCB		4OC	2L	✓	/ / /
Inorganics		HNO_3	1L	✓	/ / /
Explosives		4°C	2x1L	✓	/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-03
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: GPI	**Date started:** 03/20/96	**Compltd:** 03/20/96
Method: HSA	**Casing Size:** 10 in. OD	**Screen Int.:** 10 ft.	**Protection level:** D
Ground Elev.:	**Type of OVM:** Porta FID II	**Total depth:** 16Ft.	**Dpth to ⊻** 11 Ft.
Logged by: WDO	**Material:** PVC		

Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
0	39B00301 0-1' CLP				Limerock			
1					Fine SAND, tan, loose, damp, subrounded quartz sand		SP	
2				0				Posthole
4			60%	0				1,2,2,3
5					Fine SAND and silty fine SAND, brown to off-white, wet at 11 ft.		SM	
6			80%	0				2,4,4,3
8	39B00302 39B00302D 8-10' CLP		90%	0				4,5,6,7
10			90%	0				3,4,8,15
11								⊻
12			70%	0				5,9,14,20
13					Silty SAND, brown			
14			80%	0				16,27,24,29
16					Boring terminated at 16 feet bgs			
20								

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DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

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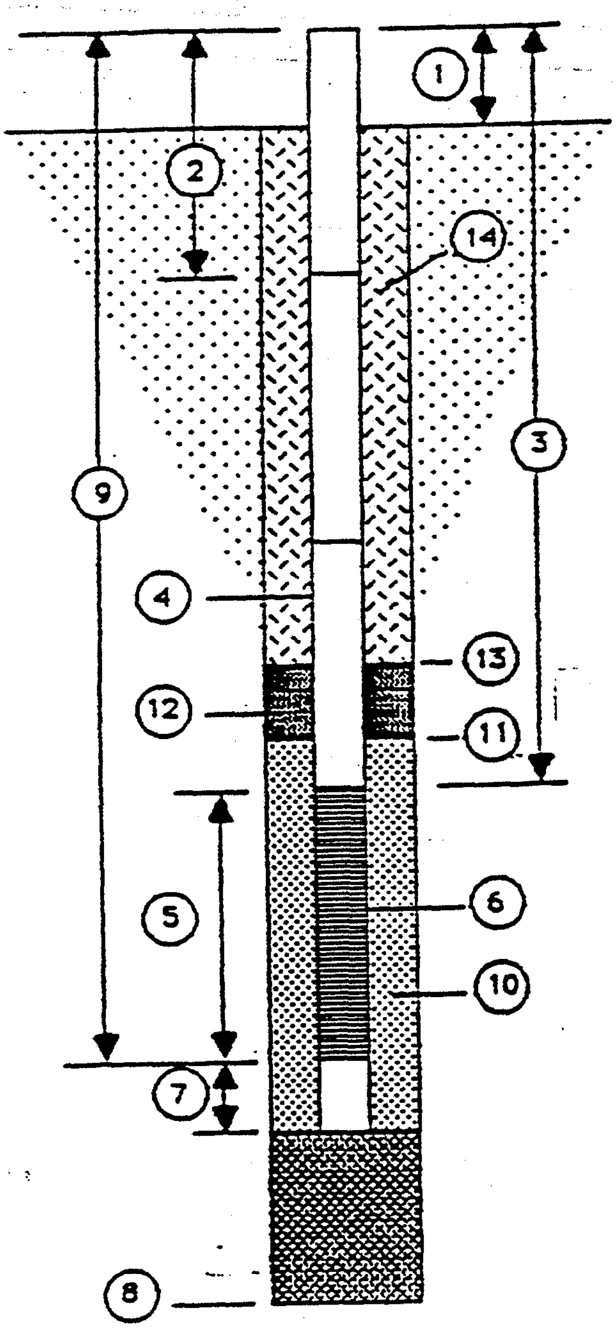
WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-39-03

DATE OF INSTALLATION 3/20/96



1. Height of Casing above ground Flush
2. Depth to first Coupling 6' BLS

   Coupling Interval Depths 6', 16'

3. Total Length of Blank Pipe 6'
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 10'
6. Type of Screen 0.010 Slot Screen
7. Length of Sump 6"
8. Total Depth of Boring 16.5' Hole Diameter 8"
9. Depth To Bottom of Screen 16'
10. Type of Screen Filter 20/30 Silica Sand

    Quantity Used 550 Size 20/30 U/C

11. Depth To Top of Filter 3' 3-6' 30/65 Sand
12. Type of Seal Bentonite

    Quantity Used 50 lb

13. Depth To Top of Seal 2 1/2'
14. Type of Grout Portland

    Grout Mixture Bentonite

    Method of Placement Pour

COMMENTS ON INSTALLATION:

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08519.10
Date: 4-3/96
Sample Location ID: OLD-39-03
Time: Start: 1022 End: 1211
Signature of Sampler: William D. Olsen

Water Level/Well Data

Well Depth 16.29 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up FM Ft. (from ground)
Protective NA Ft. Casing/Well Difference
Protective NA Ft. Casing

Depth to Water 8.54 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 7.75 Ft. X ✓ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.) = 1.24 Gal/Vol; 5 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	✓	
Concrete Collar Intact	✓	
Other ______		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ Ø Gal.	@ 2 Gal.	@ 3 Gal.	@ 4 Gal.	@ 5 Gal.
Temperature, Deg. C	23.0	23.0	23.0	23.0	23.0
pH, units	6.51	6.61	6.60	6.61	6.60
Specific Conductivity	294	298	296	293	292
TURB ~~(umhos/cm @ 25 Deg. C)~~	28.7	24.3	21.9	20.3	19.36
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL		✓	
SVOA		4oC		✓	
Pest/PCB		4oC		✓	
Inorganics		HNO_3		✓	
Explosives		4°C		✓	
TPH		H_2SO_4			
TOC		H_2SO_4			
Nitrate		H_2SO_4			

Notes:

GROUNDWATER SAMPLE FIELD DATA

Project: ~~SA~~ 39 SUPP SCREENING
Point of Interest: OLD-39-03
Project Number: 8579.10
Date: 11/27/96
Sample Location ID: OLD-39-03
Time: Start: 0919 End: 1055
Signature of Sampler: ______

Water Level/Well Data

Well Depth 16' Ft. ___ Measured X Historical ___ Top of Well ___ Top of Protective Casing
Well Riser Stick-up ___ Ft. (from ground)
Protective ___ Ft. Casing/Well Difference FLUSH
Protective ___ Ft. Casing

Depth to Water ___ Ft. 10.84
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 7 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.)] = 2 Gal/Vol; 20 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	X	
Concrete Collar Intact	X	
Other	~~X~~	

Equipment Documentation

Purging/Sampling Equipment Used:

Purging (✓ If Used For)	Sampling (✓ If Used For)		Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used: (✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- ___ Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- X None
- ___ NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ INITIAL Gal.	@ 6 Gal.	@ 10 Gal.	@ 14 Gal.	@ 20 Gal.
Temperature, Deg. C	22	23	23	24	24
pH, units	6.67	7.47	6.38	6.46	6.29
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	249	248	242	241	238
Oxidation - Reduction, +/- mv					
~~Dissolved Oxygen, ppm~~ TURB	5.91	4.44	3.86	2.87	3.76

Sample Collection Requirements (✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4oC			/ / /
Pest/PCB		4oC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes: COLLECT 5x 40 ML VIALS, ANALYZED FOR EPA 524.2

COLLECT DUPLICATE OLD-39-03D AT THIS LOCATION

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-16/97
Sample Location ID: OLD-39-03A
Time: Start: 1000 End: 1245
Signature of Sampler: ____

Water Level/Well Data

Well Depth 16.00 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up NA Ft. (from ground)

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 12.42 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 3.58 Ft. × X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = 0.57 Gal/Vol; 5 Total Gal Purged

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other ____ — Yes ___ No ___ NA

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm

Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 0.1 Gal.	@ 1.5 Gal.	@ 2.5 Gal.	@ 4.2 Gal.	@ 5 Gal.
Temperature, Deg. C	23.6	23.6	23.5	24.0	24.8
pH, units	6.51	6.38	6.42	6.46	6.48
Specific Conductivity	227	211	210	209	211
~~(umhos/cm. @ 25 Deg. C.)~~ NTU	13.82	7.10	3.42	2.88	2.~~88~~64
Oxidation - Reduction, +/- mv	—	—	—	—	213.2
Dissolved Oxygen, ~~ppm~~	—	—	—	—	3.0 mg/l

Fe 0.1 mg/l
CO_2 40 mg/l
Cl^- 10 mg/l
H_2S 0.1 mg/l
Fe^{2+} 0.1 mg/l
ALK(Ph) Ø
ALK 81.6

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4ºC			/ / /
Pest/PCB		4ºC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4ºC			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes: ____

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-04
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: GPI	**Date started:** 03/20/98	**Compltd:** 03/20/98
Method: HSA	**Casing Size:** 10 in. OD / **Screen Int.:** 10 ft.	**Protection level:** D
Ground Elev.:	**Type of OVM.:** Porta FID II / **Total depth:** 16Ft.	**Dpth to** ▽ 9 Ft.
Logged by: WDO	**Material:** PVC	

Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
0–1	39B00401 0-1' CLP				Asphalt/limerock			
1–4				0	Fine SAND with silt, brown		SM	Posthole
4–6			90%	0	Fine SAND, yellow, subrounded, some black grains		SP	2,2,2,2
6–7			70%	0				2,2,2,2
7–8					Fine SAND and silty fine SAND, brown, wet at 8 feet, increased silt with depth		SM	
8–10	39B00402 8-10' CLP		90%	0				2,2,2,2
10–12			80%	0				2,3,8,10
12–14			80%	0				7,9,12,13
14–16			90%	0				5,6,11,13
16					Boring terminated at 16 feet bgs			

 ABB ENVIRONMENTAL SERVICES, INC.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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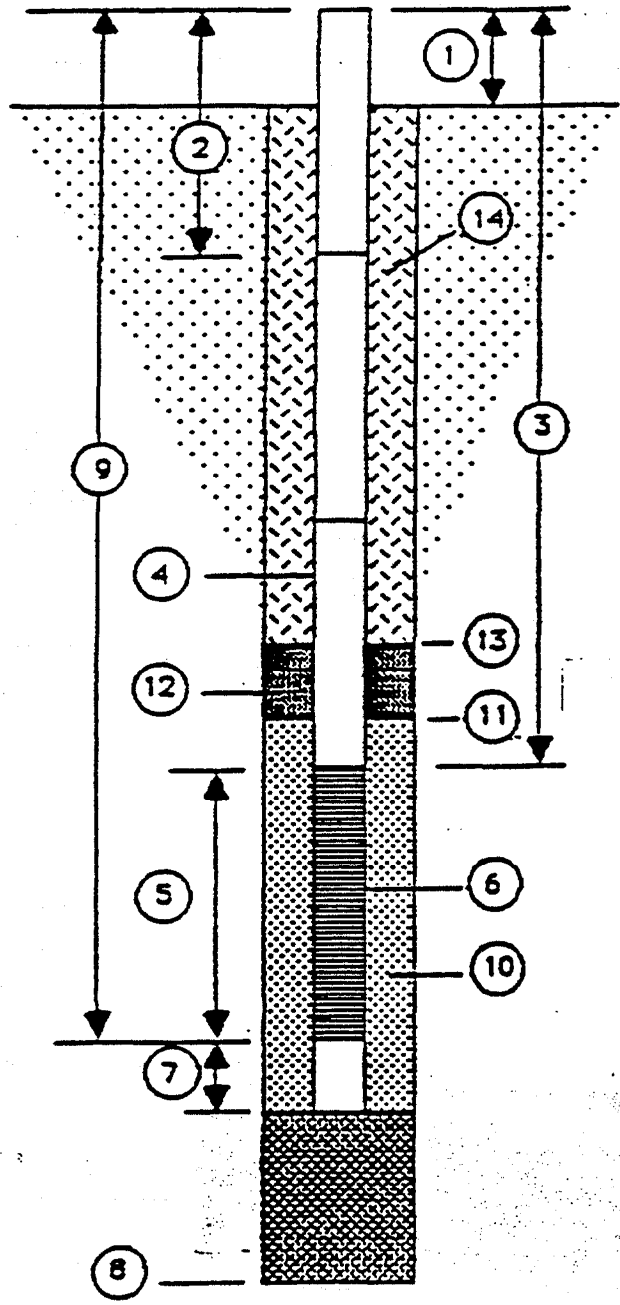
WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-30-04

DATE OF INSTALLATION 3/20/92



1. Height of Casing above ground Flush
2. Depth to first Coupling 6' BLS

   Coupling Interval Depths 6', 16'

3. Total Length of Blank Pipe 6'
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 10'
6. Type of Screen 0.010 Slot Screen
7. Length of Sump 6"
8. Total Depth of Boring 16.5' Hole Diameter 8"
9. Depth To Bottom of Screen 16'
10. Type of Screen Filter 20/30 Silica Sand

    Quantity Used 450 lb Size 20/30 U/C

11. Depth To Top of Filter 3' 3-6' 30/65 Sand
12. Type of Seal Bentonite

    Quantity Used 12 lb

13. Depth To Top of Seal 2½'
14. Type of Grout Portland

    Grout Mixture Bentonite

    Method of Placement Pour

COMMENTS ON INSTALLATION:

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Project Number: 08519.10
Sample Location ID: OLD-39-04
Time: Start: 1300 End: 1357

Point of Interest: SA 39
Date: 4-3-96
Signature of Sampler: WDO

Water Level/Well Data

Well Depth 14.94 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up FM Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 7.91 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 7.03 Ft. X ✓ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.) = [1.12 Gal/Vol; 4.5 Total Gal Purged]

Well Integrity:	Yes	No
Prot. Casing Secure	✓	
Concrete Collar Intact	✓	
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
✓	✓	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
✓	✓	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
✓ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid ___ Colored ___ Clear ___ Odor ___ Cloudy

Purge Data	@ ∅ Gal.	@ 3.0 Gal.	@ 3.5 Gal.	@ 4.0 Gal.	@ 4.5 Gal.
Temperature, Deg. C	25.0	25.0	25.5	25.5	25.0
pH, units	5.55	5.58	5.60	5.55	5.62
Specific Conductivity	90	~~449~~ 88	90	90	92
TURB ~~(umhos/cm @ 25 Deg. C)~~	34.7	44.9	44.4	43.2	40.2
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL		✓	/ / /
SVOA		4OC		✓	/ / /
Pest/PCB		4OC		✓	/ / /
Inorganics		HNO_3		✓	/ / /
Explosives		4°C		✓	/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-05
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: GPI	**Date started:** 03/20/96	**Compltd:** 03/20/96
Method: HSA	**Casing Size:** 10 in. OD	**Screen Int.:** 10 ft.
Protection level: D		
Ground Elev.:	**Type of OVM.:** Porta FID II	**Total depth:** 16Ft.
Dpth to ▽ 9.5 Ft.		
Logged by: WDO	**Material:** PVC	

Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
0	39B00501 0-1' CLP				Sand/limerock			
					Fine SAND with silt, mottled off-white and brown, loose, grades to off-white fine SAND at 2 feet, wet at 9.5 feet, yellow staining at 9.5-10.5 feet		SP	
2				0				Posthole
4				0				2,4,7,11
5			90%					
6				0				5,6,8,9
7			70%					
8	39B00502 8-10' CLP			0				8,8,7,8
9			80%					
10				0				5,4,8,10
11			90%					
12				0	Dark brown silty SAND, slightly cohesive		SM	7,11,14,27
13			90%					
14				0				14,12,17,21
15			90%					
16					Boring terminated at 16 feet bgs			
20								

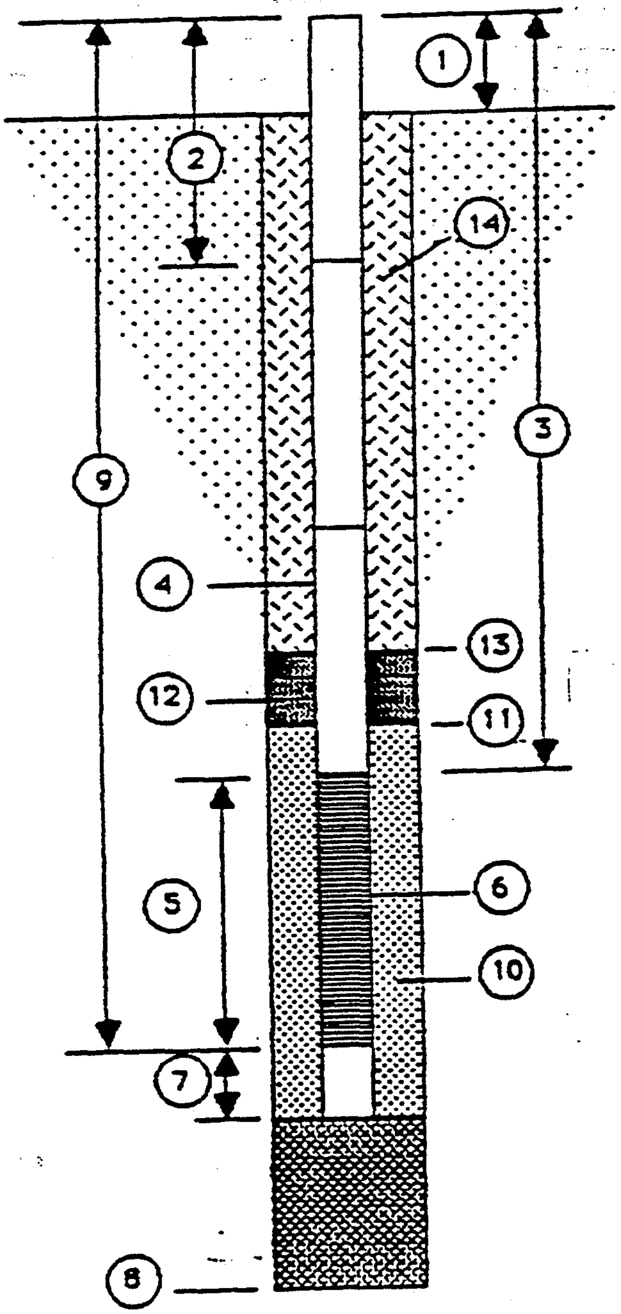
ABB ENVIRONMENTAL SERVICES, INC.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-39-05

DATE OF INSTALLATION 3/20/06



1. Height of Casing above ground Flush
2. Depth to first Coupling 6' BLS

   Coupling Interval Depths 6', 16'

3. Total Length of Blank Pipe 6'
4. Type of Blank Pipe Schedule 40 PVC
5. Length of Screen 10'
6. Type of Screen 0.010 Slot Screen
7. Length of Sump 6"
8. Total Depth of Boring 16.5' Hole Diameter 8"
9. Depth To Bottom of Screen 16'
10. Type of Screen Filter 20/30 Silica Sand

    Quantity Used 500 lb Size 20/30 U/C

11. Depth To Top of Filter 3' 3-6' 30/65 Sand
12. Type of Seal Bentonite

    Quantity Used

13. Depth To Top of Seal 2½'
14. Type of Grout Portland

    Grout Mixture Bentonite

    Method of Placement Pour

COMMENTS ON INSTALLATION:

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08519.10
Date: 4.3/96
Sample Location ID: OLD-39-05
Time: Start: 0829 End: 1004
Signature of Sampler: JMN

Water Level/Well Data

Well Depth 14.64 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up (from ground) FM Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 8.82 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 5.82 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.)] = 0.93 Gal/Vol; 5 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	X	
Concrete Collar Intact	X	
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ Ø Gal.	@ 3.5 Gal.	@ 4.0 Gal.	@ 4.5 Gal.	@ 5 Gal.
Temperature, Deg. C	21.5	21.5	21.5	21.5	21.5
pH, units	6.01	6.36	6.44	6.45	6.45
Specific Conductivity	242	264	289	289	289
TURB ~~(umhos/cm. @ 25 Deg. C)~~	28.5	33.8	33.9	32.7	31.0
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL		✓	/ / /
SVOA		4OC		✓	/ / /
Pest/PCB		4OC		✓	/ / /
Inorganics		HNO_3		✓	/ / /
Explosives		4°C		✓	/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

Project: BRAC NTC	**Site:** S.A. 39	**Boring ID:** OLD-39-06
Client: SOUTHDIVNAVFACENGCOM		**Job No.:** 8519.10
Contractor: ABB-ES	**Date started:** 04/22/96	**Compltd:** 04/22/96
Method: Hand Auger	**Casing Size:** 4 in. / **Screen Int.:** 5 ft.	**Protection level:** D
Ground Elev.:	**Type of OVM.:** Porta FID II / **Total depth:** 9Ft.	**Dpth to ▽** 8 Ft.
Logged by: WDO	**Material:** PVC	

Depth Ft.	Sample ID (Depth) (Type)	Split Spoon	Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.
					Fine SAND, brown		SP	
				0				NA
				0				
5				0				
				0				
				0	Boring terminated at 9 feet bgs			
10								

 ABB ENVIRONMENTAL SERVICES, INC.

SOIL BORING LOG

Point of Interest: SA-39	
Boring No.: OLD-39-07B	
Client:	Project No. 8519.10
Contractor: G. P.	Date Started: 11/21/96
Protection: D	Completed: 11/21/96
Method: SPT	Casing Size: NA
PI Meter: —	
Ground Elev.: NA	Soil Drilled: NA
Total Depth: 80'	
Logged by: J. NASH	Checked by: PEM
∇ Below Ground: 10'	
Screen: 27- (ft.) 32' BLS	Riser: 0- (ft.) 27' BLS
Diam: 2" (ID)	Material: PVC
Page 1 of: 2	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
5											
∇ 10						BEGIN SPT AT BASE OF EXISTING WELL OLD-39-03 (16' BLS)					
15					φ	DK BROWN SILTY FINE-GRAINED SAND.					15/17/21/23
											18/21/24/26
20											10/12/21/30
							SP				15/16/24/30
25											44/50+
											32/41/36/50
WELL SCREEN											30/50+
30						BROWN, CLAYEY SILTY FINE-GRAINED SAND. FEW LENSES OF SANDY CLAY.					25/22/23/24
							SM/				9/13/16/14
35						CLAY STIFF, DK. GREEN.	CL				9/12/16/18
						TAN, FINE TO MEDIUM-GRAINED SAND. ~~SILTY~~					6/18/14/15
40							SP				10/18/15/15
											3/3/8/19
						OLIVE-GREEN SILTY, FINE TO COARSE-GRAINED SAND (HAWTHORN ?)					6/10/13/17
45											3/4/4/7
							SP				4/6/8/18
50					↓						6/7/16/18

PROPORTIONS	(-) AMOUNT (-)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	SS = Split Spoon
m = medium	bn = brown	SW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLAND
Project Number: 08519.10
Sample Location ID: OLD-39-06 (TW)
Time: Start: 0913 End: 1010

Point of Interest: SA 39
Date: 4-23-96
Signature of Sampler: JMN

Water Level/Well Data

Well Depth 10.44 Ft. X Measured __ Historical

X Top of Well __ Top of Protective Casing

Well Riser Stick-up (from ground) 1.5 Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 7.81 Ft.

Well Material: X PVC __ SS

Well Locked?: X Yes __ No

Well Dia. X 2 inch __ 4 inch __ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe __ Float Activated __ Press. Transducer

Height of Water Column 2.63 Ft. X X .16 Gal/Ft. (2 in.) __ .65 Gal/Ft. (4 in.) __ 1.5 Gal/Ft. (6 in.) __ Gal/Ft. (__ in.) = 0.42 Gal/Vol; 3 Total Gal Purged

Well Integrity:		Yes	No
Prot. Casing Secure	NA		
Concrete Collar Intact	NA		
Other			

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
- __ Methanol (100%)
- __ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- __ Liquinox Solution
- __ Hexane
- __ HNO_3/D.I. Water Solution
- __ Potable Water
- __ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected __ In-line X In Container

Sample Observations: __ Turbid __ Colored X Clear __ Odor __ Cloudy

Purge Data	@ 0.5 Gal.	@ 1.5 Gal.	@ 2.0 Gal.	@ 2.5 Gal.	@ 3.0 Gal.
Temperature, Deg. C	6.97	6.87	7.08	7.08	7.07
pH, units	22.5	24.5	24.5	24.5	24.3
Specific Conductivity	685	750	750	710	750
TURB ~~(umhos/cm @ 25 deg. C)~~	7200	46.1	8.87	4.52	2.54
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

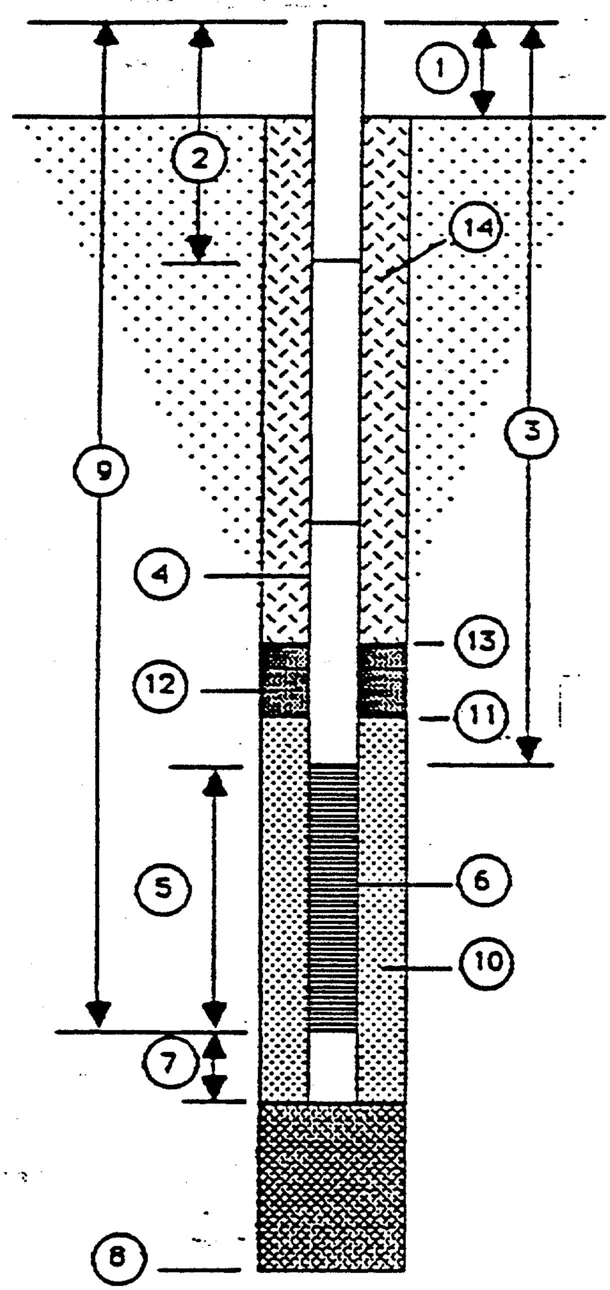
Notes: Herbicides only

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-39-07B

DATE OF INSTALLATION 11/21/96



1. Height of Casing above ground FLUSH
2. Depth to first Coupling 7' BLS

   Coupling Interval Depths 7, 17, 27

3. Total Length of Blank Pipe 27'
4. Type of Blank Pipe PVC
5. Length of Screen 5'
6. Type of Screen PVC, .01" SLOT
7. Length of Sump 6"
8. Total Depth of Boring 32.5 Hole Diameter 8"
9. Depth To Bottom of Screen 32'
10. Type of Screen Filter 20/30 SAND

    Quantity Used 400 lb Size 20/30 U/C

11. Depth To Top of Filter 25'
12. Type of Seal BENTONITE

    Quantity Used 150 lb

13. Depth To Top of Seal 23
14. Type of Grout PORTLAND

    Grout Mixture BENTONITE

    Method of Placement TREMIE

COMMENTS ON INSTALLATION: EQUIPPED w/LOCKING CAP, BOLT-DOWN COVER.

SOIL BORING LOG

Client:	Project No.:	Point of Interest: OD-39-07B
Contractor:	Date Started:	Boring No.:
Method:	Casing Size:	Protection:
Ground Elev.:	Soil Drilled:	Completed:
Logged by:	Checked by:	PI Meter:
Screen: (ft.)	Riser: (ft.) Diam: (ID) Material:	Total Depth:
		▽ Below Ground:
		Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
50					ϕ						1/1/2/3
											1/1/1/5
55						AS ABOVE.					4/4/10/14
											4/4/10/24
											10/24/30/35
60											8/13/19/20
											34/34/[illegible]
65											22/30/4[illegible]
											30/32/37/3[illegible]
											45/53 +
70											13/17/22/2[illegible]
											23/32/34/4[illegible]
75											36/42/39/4[illegible]
											9/14/35/30
											16/16/16/2[illegible]
80						TD BORING (SPT COLLECTION)					

PROPORTIONS	(-) AMOUNT (+)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	MS = Split Spoon
m = medium	bn = brown	SW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-15/97
Sample Location ID: OLD-39-07B
Time: Start: 1555 End: 1800
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 31.70 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 12.69 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 19.01 Ft. X [X] .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__in.) = 3.04 Gal/Vol; 8 Total Gal Purged

Well Integrity: Yes / No
Prot. Casing Secure
Concrete Collar Intact — NA
Other

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

(✓ If Used For)

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

H_2S - 2.0 mg/l
Cl - 0.15 mg/l
Fe 0.6 mg/l
Fe^{2+} 0.5 mg/l
ALK (Ph) ∅
ALK = 20.4 m
CO_2 50 mg/l

Purge Data	@ 2.5 Gal.	@ 5 Gal.	@ 7 Gal.	@ 7.5 Gal.	@ 8 Gal.
Temperature, Deg. C	26.9	26.6	25.7	25.4	25.2
pH, units	5.06	5.24	5.21	5.25	5.22
Specific Conductivity	75	85	80	88	80
~~(umhos/cm @ 25 Deg. C)~~ NTU	67.0	62.5	63.6	62.2	64.9
Oxidation - Reduction, +/- mv	—	—	—	—	32.0
Dissolved Oxygen, ~~ppm~~ mg/l	—	—	—	—	0.7

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
~~TPH~~		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

GROUNDWATER SAMPLE FIELD DATA

Project: SA-39 SUPP SCREENING
Project Number: 8579.10
Sample Location ID: OLD-39-07B
Time: Start: 0930 End: 1255

Point of Interest: OLD-39-07B
Date: 11/27/96

Signature of Sampler: ______

Water Level/Well Data

Well Depth 32 Ft. __ Measured X Historical __ Top of Well __ Top of Protective Casing

Well Riser Stick-up (from ground) ___ Ft.

Protective Casing/Well Difference ___ Ft. FLUSH

Protective Casing ___ Ft.

Depth to Water ___ Ft. 10.62

Well Material: X PVC __ SS

Well Locked?: X Yes __ No

Well Dia. X 2 inch __ 4 inch __ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe __ Float Activated __ Press. Transducer

Height of Water Column 20 Ft. X __ .16 Gal/Ft. (2 in.) __ .65 Gal/Ft. (4 in.) __ 1.5 Gal/Ft. (6 in.) __ Gal/Ft. (__ in.) = 4 Gal/Vol; 19 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	X	
Concrete Collar Intact	X	
Other ______		

Equipment Documentation

Purging/Sampling Equipment Used:

Purging (✓ If Used For)	Sampling (✓ If Used For)		Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
- __ Methanol (100%)
- __ 25% Methanol/75% ASTM Type II water
- __ Deionized Water
- __ Liquinox Solution
- __ Hexane
- __ HNO_3/D.I. Water Solution
- __ Potable Water
- __ None
- X NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm

Field Data Collected __ In-line X In Container

Sample Observations: X Turbid __ Clear __ Cloudy __ Colored __ Odor

Purge Data	@ INITIAL Gal.	@ 5 Gal.	@ 8 Gal.	@ 10 Gal.	@ 14 Gal.	16	19
Temperature, Deg. C	22	23	23	24	25	24	24
pH, units	5.65	6.31	5.65	5.64	5.56	5.69	5.4
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	209	180	168	168	147	138	139
Oxidation - Reduction, +/- mv							
~~Dissolved Oxygen, ppm~~ TURB	7200	7200	7200	7200	7200	7200	7200

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4C			/ / /
Pest/PCB		4C			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes: COLLECT 3 X 40 ML VIALS. ANALYZED for EDA 524.2

GROUNDWATER SAMPLE FIELD DATA

Project: NTC - ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-15-97
Sample Location ID: OLD-39-26C
Time: Start: 1305 End: 1535
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth ~~12.74~~ 39.80 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up (from ground) NA Ft.
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 12.74 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 27.06 Ft. X [X .16 Gal/Ft. (2 in.) / ___ .65 Gal/Ft. (4 in.) / ___ 1.5 Gal/Ft. (6 in.) / ___ Gal/Ft. (__ in.)] = 4.32 Gal/Vol; 19 Total Gal Purged

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other — NA (Yes / No)

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used: (✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ ___ Gal.	@ 15 Gal.	@ ___ Gal.	@ ___ Gal.	@ 19 Gal.
Temperature, Deg. C	26.5	26.3	25.8	25.8	25.9
pH, units	5.78	5.63	5.60	5.65	5.60
Specific Conductivity	105	102	100	100	98
~~(umhos/cm @ 25 Deg. C)~~ NTU	41.2	31.5	29.4	26.9	24.9
Oxidation - Reduction, +/- mv					-22.7
Dissolved Oxygen, ~~ppm~~ mg/l					0.61

Fe^{2+} - 0.6 mg/l
H_2S - 2.0 mg/l
Cl^{2-} 15 mg/l
Fe 0.8 mg/l
CO_2 50 mg/l
ALK (PH) = Ø
ALK = 34 mg/l

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			
SVOA		4OC			
Pest/PCB		4OC			
Inorganics		HNO_3			
Explosives		4°C			
TPH		H_2SO_4			
TOC		H_2SO_4			
Nitrate		H_2SO_4			

Notes:

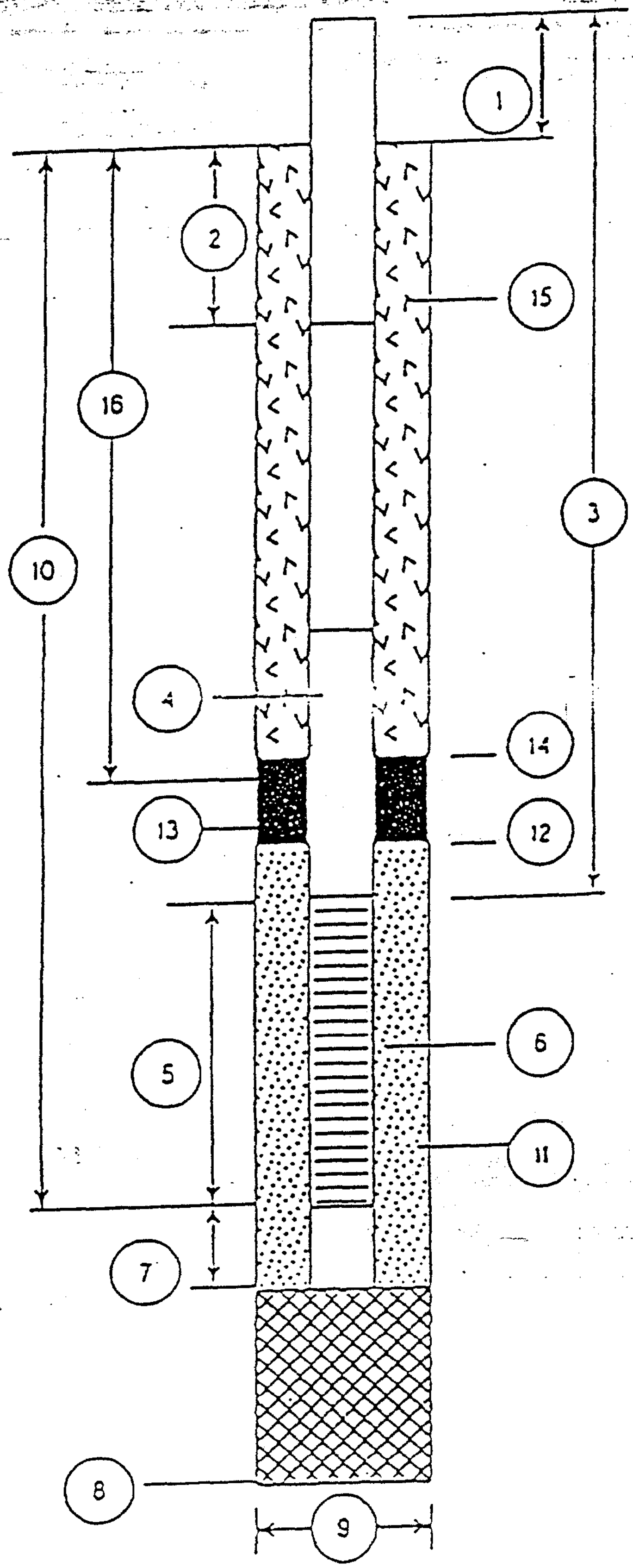
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-26C

DATE OF INSTALLATION: 5-1A



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 35'
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 Slot
7. Length of Sump: 6"
8. Total Depth of Boring: 40'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 40'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 75 lb Size: 20/30
12. Depth to Top of Filter: 33'
13. Type of Seal: fine sand/Bentonite
    Quantity Used: 25/30 lb
14. Depth to Top of Seal: 29'
15. Type of Grout: Neat Cement
    Grout Mixture:
    Method of Placement: Tremie
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 31'

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545,10
Date: 5-15/97
Sample Location ID: OLD-39-25C
Time: Start: 0830 End: 1215
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 39.62 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up (from ground) N/A Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 12.67 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 26.95 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 4.3 Gal/Vol; 18 Total Gal Purged

Well Integrity: Yes No
Prot. Casing Secure NA
Concrete Collar Intact
Other

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm

Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ ___ Gal.	@ ___ Gal.	@ 15 Gal.	@ ___ Gal.	@ 18 Gal.
Temperature, Deg. C	24.7	25.1	24.7	25.1	25.0
pH, units	6.04	5.92	5.10	5.91	5.91
Specific Conductivity	260	248	245	240	239
~~(umhos/cm @ 25 Deg. C)~~					
~~Oxidation - Reduction, +/- mv~~					
~~Dissolved Oxygen, ppm~~ NTU	26.6	22.1	18.32	16.86	14.74

Redox = 17.3 mV
H_2S = 2.0 mg/l
Fe = 1.0 mg/l
Cl^- = 45 mg/l
DO = 0.75 mg/l
ALK (PH) Ø mg/l
ALK 50 mg/l
CO_2 80 mg/l
Fe^{2+} 0.8 mg/l

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL	3 X 40 ml		/ / /
~~SVOA~~		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
~~TOC~~		H_2SO_4	1 x 250 ml		/ / /
Nitrate		H_2SO_4	1 x 1 l		/ / /

Notes:

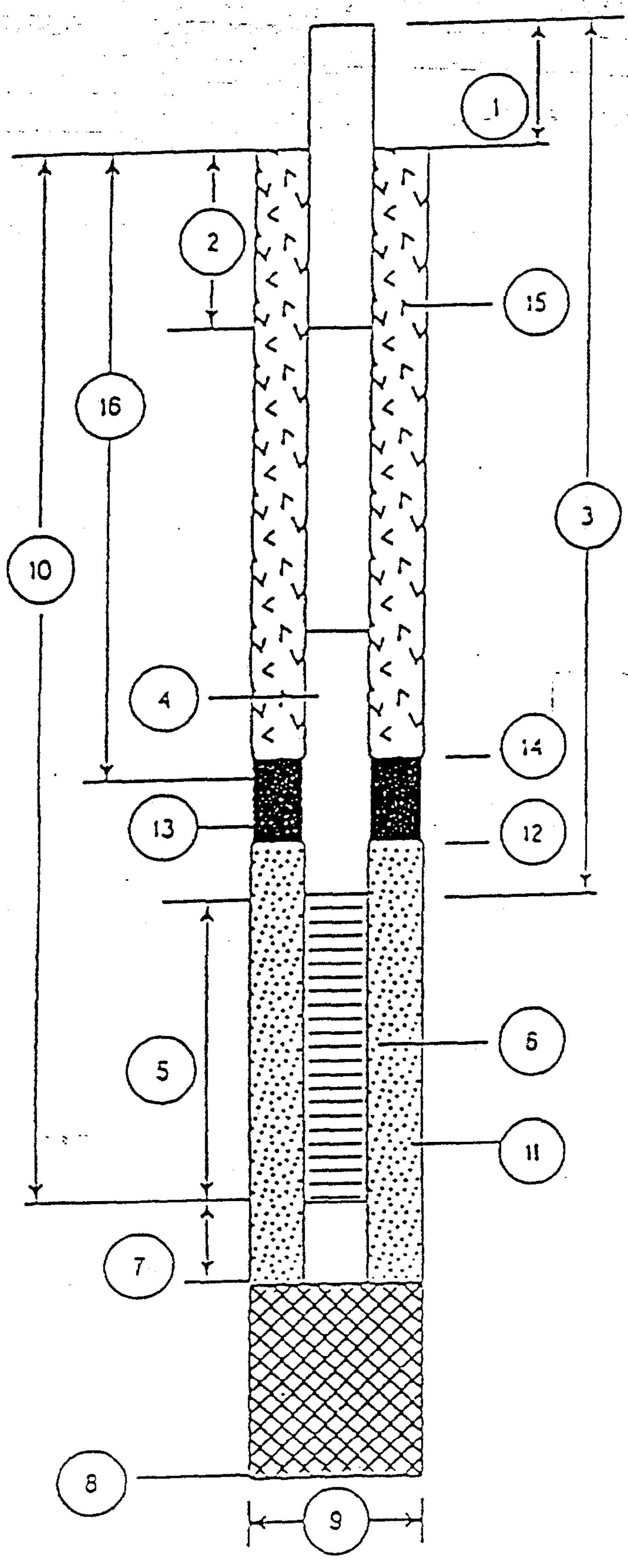
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-25C

DATE OF INSTALLATION: 5-2



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 35'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 40'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 40'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 75 lb Size: 20/30
12. Depth to Top of Filter: 33'
13. Type of Seal: Fine Sand / Bentonite
    Quantity Used: 25/30 lb
14. Depth to Top of Seal: 29'
15. Type of Grout: Neat cement
    Grout Mixture:
    Method of Placement: tremie
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 31'

SOIL BORING LOG

Client: South DIV	Project No. 08545.10		Point of Interest: SA39
			Boring No.: OLD-39-25
			Protection: D
Contractor: CDS	Date Started: 4-24/97		Completed: 5-2/97
Method: HSA/Rotary	Casing Size: 15"/6"		PI Meter: Porta FID
Ground Elev.: 0	Soil Drilled: 40'		Total Depth: 40'
Logged by: WDO	Checked by:		▽ Below Ground:
Screen: 5 (ft.)	Riser: 35 (ft.)	Diam: 2" (ID) / Material: PVC	Page 2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	FID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
25–27				80	∅	Tan fine sand w/white fine sand lenS @ 28ft.	SP	25, –, 12, 14			
27–29				70	∅			16, 12, 6, 12			
29–31				80	∅	Brown Sandy Clay, Stiff.	SC	18, 22			
						Offwhite medium sand w/shell mat.	SP	3, 4			
31–33				70	∅	Stiff Silty Clay, gray, hard, non plastic, trace medium sand sandier w/depth	CL	5, 10, 8, 17			
33–35				80	∅	off white fine sand, some medium; silty lens @37' increased silt after 39'	SP	21, 21, 4, 6			
35–37				50	∅			10, 11, 6, 14			
37–39				80	∅			15, 14, 10, 9			
39–40				60	∅			11, 18			
40											

PROPORTIONS	(-) AMOUNT (-)	ABBREVIATIONS		
Trace (tr)	0-10%	f = fine	gr = gray	MS = Split Spoon
Little (li)	10-20%	m = medium	bn = brown	SW = Screened Auger
Some (so)	20-35%	c = coarse	blk = black	HP = Hydropunch
and	35-50%			

SOIL BORING LOG

Client: South Div	Project No. 08545.10	Point of Interest: SA 39
Contractor: CDS	Date Started: 4-24-97	Boring No.: OLD-39-2S
Method: HSA/Rotary	Casing Size: 15" / 6"	Protection: D
Ground Elev.:	Soil Drilled: 40'	Completed: 5-2/97
Logged by: WDO	Checked by:	PI Meter: PortaFID
Screen: 5 (ft.)	Riser: 35 (ft.)	Total Depth: 40'
Diam: 2" (ID)	Material: PVC	∇ Below Ground:
		Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
1				NA	Ø	Off white Fine Sand, damp @ 10', some mottling at 12', grades to:	SP	P O S T H O L E			
2											
3				NA	Ø			2 3			
4											
5				60	Ø			6 3			
6								4 3			
7				70	Ø			5 2			
8								3 4			
9				80	Ø			4 7			
10								4 5			
11				80	Ø			8 9			
12								6 10			
13				70	Ø			13 13			
14						Light Brown Fine Sand w/trace silt, grades to darker brown @ 14.5ft. gray brown after 20' dense red brown Sand and 24ft	SP	7 11			
15				90	Ø			12 13			
16								10 10			
17				80	Ø			11 10			
18								2 3			
19				90	Ø			4 2			
20								7 10			
21				60	Ø			9 12			
22								7 20			
23				60	Ø			23 11			
24						see below		16 22			

PROPORTIONS	(-) AMOUNT (+)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine, m = medium, c = coarse

gr = gray, bn = brown, blk = black

MS = Split Spoon, SW = Screened Auger, HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-14/97
Sample Location ID: OLD-39-24B
Time: Start: 1545 End: 1900
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 27.00 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up (from ground) NA Ft.
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 12.54 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 14.46 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 2.31 Gal/Vol; 10 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure	✓	
Concrete Collar Intact	✓	
Other	✓	

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm
Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 0.5 Gal.	@ 2.5 Gal.	@ 5 Gal.	@ 7.5 Gal.	@ 10 Gal.
Temperature, Deg. C	27.4	27.2	25.7	26.2	25.7
pH, units	5.61	5.44	5.56	5.53	5.49
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	200	260	258	260	255
Oxidation - Reduction, +/- mv					10.8
Dissolved Oxygen, ppm					1.5 mg/l (meter)

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

Fe - 0.5 mg/l
Fe^{2+} - 0.8 mg/l
H_2S 5 mg/l
Cl^- - 30 mg/l
CO_2 ———

ALK-(Pth) ∅
ALK - total 34 mg/l

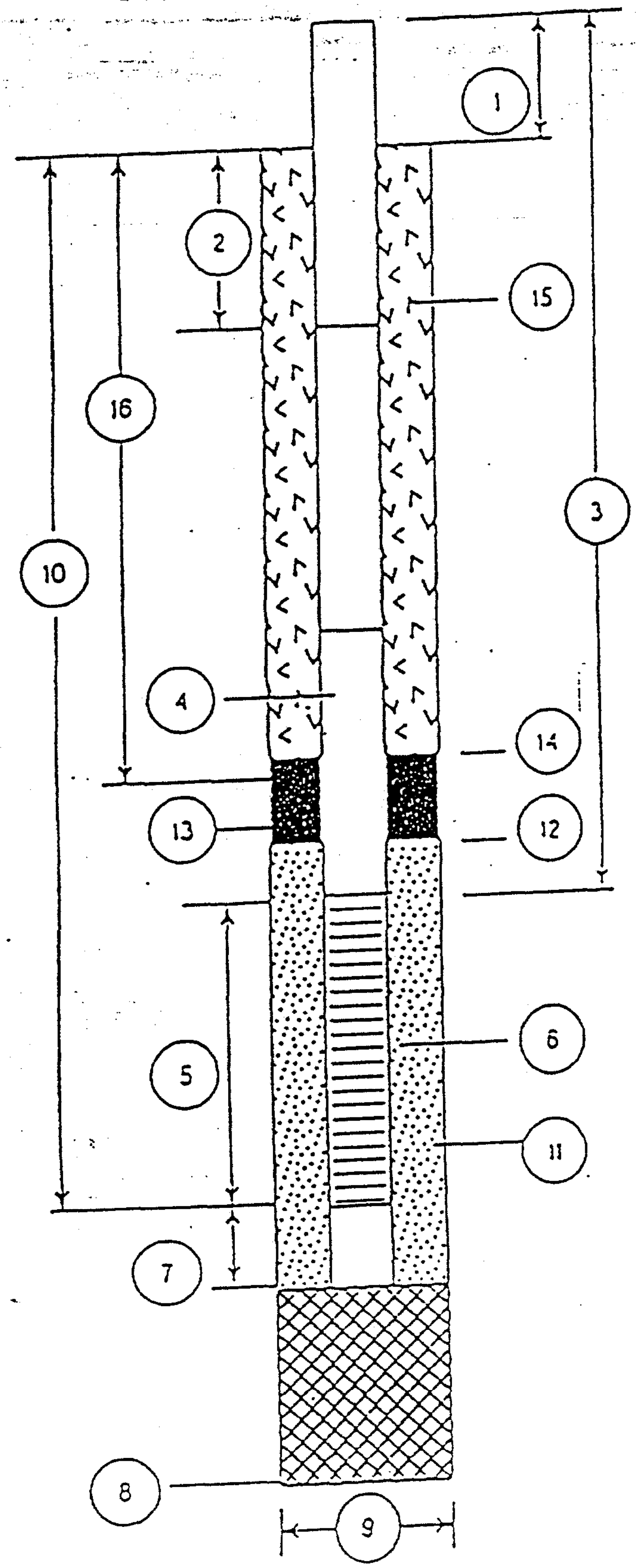
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: QLD-39-24B

DATE OF INSTALLATION: 4-22/



1. Height of Casing above ground: FM
2. Depth to first Coupling: 3'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 23'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched. 40 PVC 0.010 Slot
7. Length of Sump: 6"
8. Total Depth of Boring: 28.5'
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 28'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 300 lb   Size: 20/30
12. Depth to Top of Filter: 21'
13. Type of Seal: Fine Sand / Bentonite
    Quantity Used: 50lb / 25lb
14. Depth to Top of Seal: 17'
15. Type of Grout: Neat cement
    Grout Mixture: 94lb Portland cement / 8lb Bentonite gel / 8 gal. wat
    Method of Placement: tremie
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-14/97
Sample Location ID: OLD-39-23A
Time: Start: 1310 End: 1520
Signature of Sampler: W. [illegible] D. Olsen

Water Level/Well Data

Well Depth 17.00 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 12.65 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 4.35 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = [0.7 Gal/Vol; 4 Total Gal Purged]

Well Integrity:	Yes	No
Prot. Casing Secure		
Concrete Collar Intact		
Other ___		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 2.0 Gal.	@ 2.5 Gal.	@ 3 Gal.	@ 3.5 Gal.	@ 4 Gal.
Temperature, Deg. C	26.4	26.2	26.9	26.9	27.5
pH, units	6.46	6.43	6.48	6.43	6.48
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	448	440	430	425	430
Oxidation - Reduction, +/- mv					138.5
Dissolved Oxygen, ppm					3.75 (Winkler)

Fe 0.1 mg/l
Fe^{2+} < 0.1 mg/l
H_2S 0.3 mg/l
Cl^- 20 mg/l
CO_2 12.5 mg/l
Alk Ph 0 mg/l
Alk total 170 mg/l

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

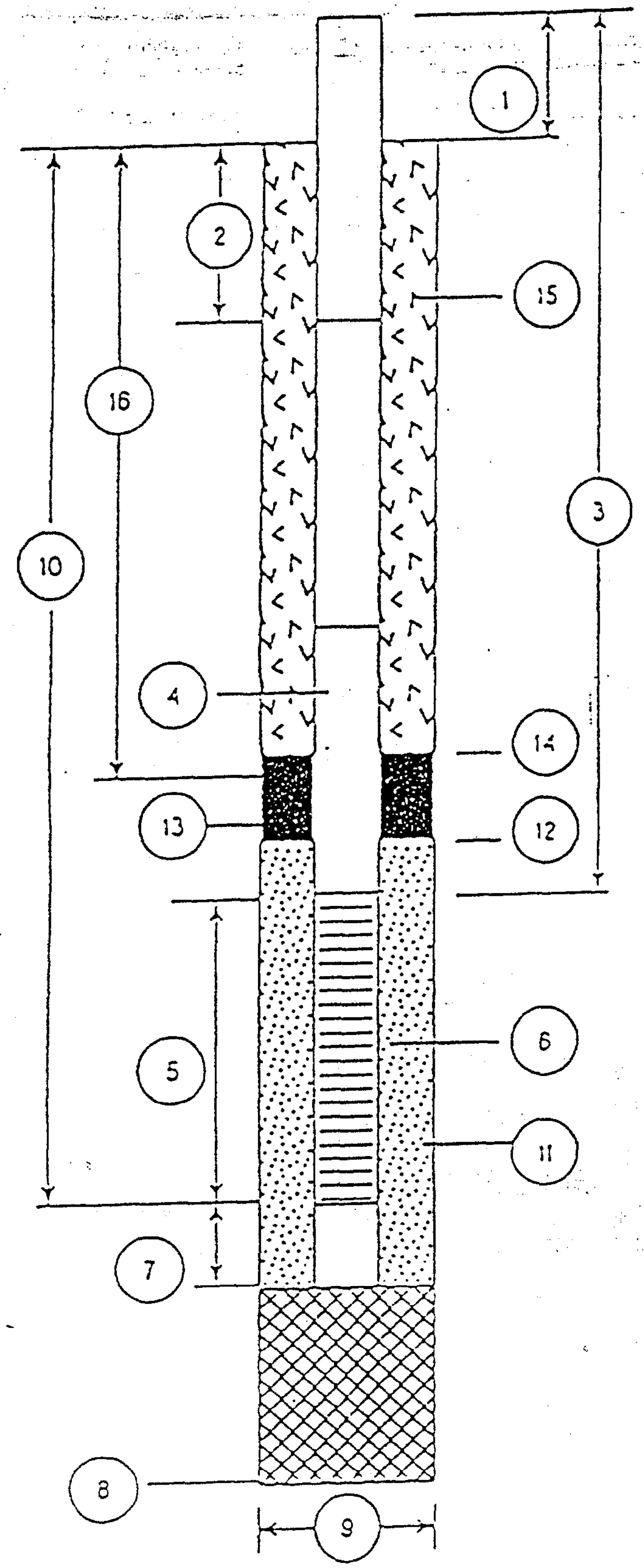
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-23A

DATE OF INSTALLATION: 4-21-97



1. Height of Casing above ground: FM
2. Depth to first Coupling: 7'

   Coupling Interval Depths: NA
3. Total Length of Riser Pipe: 7'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 17'.5
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 17'
11. Type of Screen Filter: Silica Sand

    Quantity Used: 500lb Size: 20/30
12. Depth to Top of Filter: 2
13. Type of Seal: Fine Sand/Bentonite

    Quantity Used: 50lb / 25lb
14. Depth to Top of Seal: 2'
15. Type of Grout: Neat cement

    Grout Mixture:

    Method of Placement: Pour
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08545.10
Date: 5-19-97
Sample Location ID: OLD-39-22C
Time: Start: 0855 End: 1230
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 39.70 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 14.35 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 25.35 Ft. X
X .16 Gal/Ft. (2 in.)
___ .65 Gal/Ft. (4 in.)
___ 1.5 Gal/Ft. (6 in.)
___ Gal/Ft. (__ in.)
= 4.06 Gal/Vol
20 Total Gal Purged

Well Integrity: (Yes / No) NA
Prot. Casing Secure
Concrete Collar Intact
Other ______

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid ___ Colored ___ Clear X Cloudy ___ Odor 27.0

H_2S 2.0 mg/l
Fe 0.8 mg/l
Fe^{2+} 0.7 mg/l
ALK (P.H.) ∅
ALK 51 mg/l
Cl^- 15 mg/l
CO_2 40 mg/l

Purge Data	@ 15 Gal.	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ 20 Gal.
Temperature, Deg. C	26.2	25.9	26.3	25.7	25.7
pH, units	6.00	5.88	5.79	5.78	5.74
Specific Conductivity	140	132	132	125	120
(~~umhos/cm @ Deg. C~~) NTU	61.0	47.6	43.6	41.6	43.2
Oxidation - Reduction, +/- mv	—	—	—	—	58.5
Dissolved Oxygen, ~~ppm~~	—	—	—	—	0.34 mg/l

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes: ______

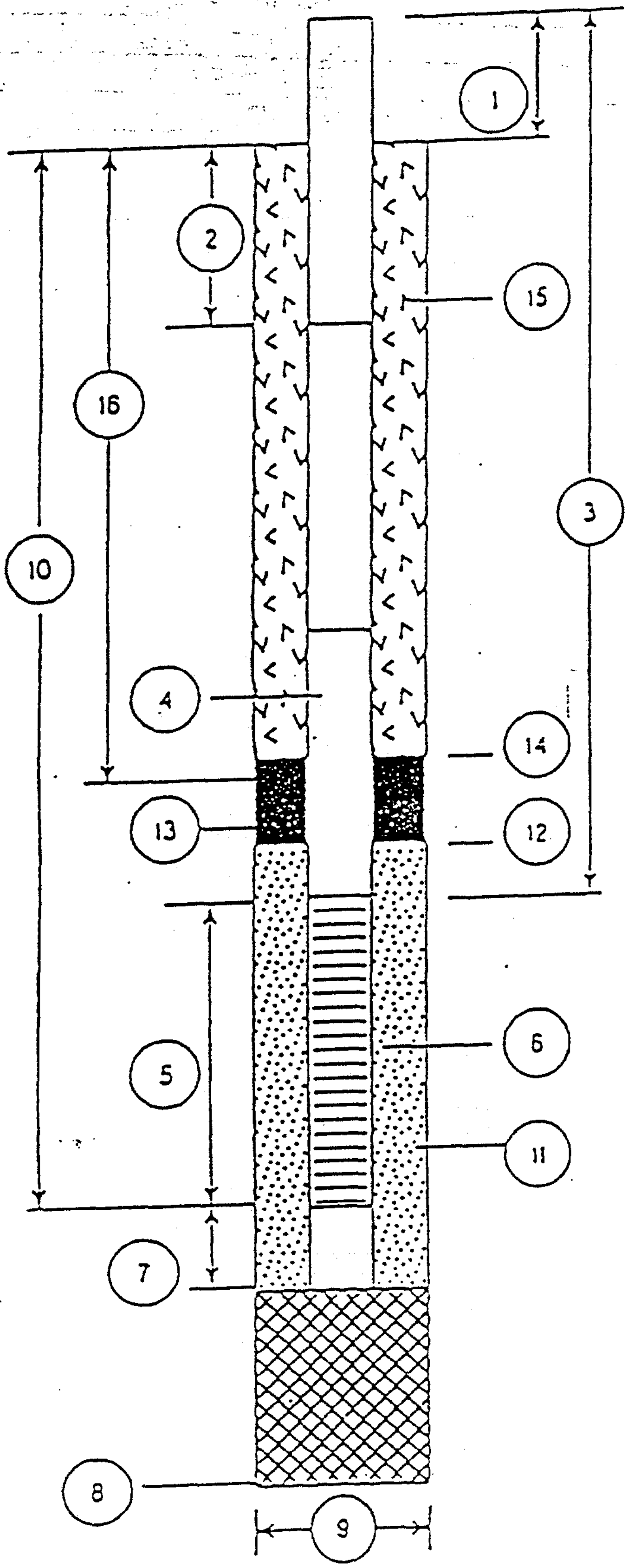
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-22C

DATE OF INSTALLATION: 5-2/6



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5
   Coupling Interval Depths: 10
3. Total Length of Riser Pipe: 35
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 40'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 40'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 75 lb Size: 20/30
12. Depth to Top of Filter: 33'
13. Type of Seal: fine Sand/Bentonite
    Quantity Used: 25/30
14. Depth to Top of Seal: 29'
15. Type of Grout: Neat Cement
    Grout Mixture:
    Method of Placement: Tremie
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 31'

SOIL BORING LOG

Client: South DIV	Project No. 08545.10	Point of Interest: SA-39	
		Boring No.: OLD-39-22	
		Protection: D	
Contractor: CDS	Date Started: 4-28/97	Completed: 5-2/97	
Method: HSA/Rotary	Casing Size: 15"/6"	PI Meter: Porta FID	
Ground Elev.:	Soil Drilled: 40'	Total Depth: 40'	
Logged by: WDO	Checked by:	▽ Below Ground:	
Screen: 5 (ft.)	Riser: (ft.)	Diam: 2 (ID)	Material: PVC
Page 2 of: 2			

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
26				90	Ø	brown fine sand w/silt		15, 19			
27				90	Ø	gray sand lens @ 25.5'		9, 26			
28						Silty dark brown lens @ 28'	SM	50, –			
29				90	Ø	brown sandy clay in spoon shoe @ 30'		2, 4			
30								7, 9			
31				90	Ø			7, 12			
32						dark gray clay, hard	CL	22, 30			
33				80	Ø	dark brown sandy clay, stiff slightly plastic	SC	5, 4			
34						brown fine sand w/silt	SM	5, 5			
35				50	Ø	dark brown clayey sand, stiff	SC	4, 5			
36								6, 6			
37				50	Ø	Tan medium and fine sand	SP	7, 9			
38								11, 13			
39				50	Ø			9, 12			
40								14, 16			

PROPORTIONS	(-) AMOUNT (-)	ABBREVIATIONS		
Trace (tr)	0-10%	f = fine	gr = gray	MS = Split Spoon
Little (li)	10-20%	m = medium	bn = brown	SW = Screened Auger
Some (so)	20-35%	c = coarse	blk = black	HP = Hydropunch
and	35-50%			

SOIL BORING LOG

Client: South Div	Project No. 08545.10		Point of Interest: SA -39
Contractor: C D S	Date Started: 4-28/97		Boring No.: OLD-39-22
Method: HSA/Rotary	Casing Size: 15" /6"		Protection: D
Ground Elev.:	Soil Drilled: 40'		Completed: 5-2/97
Logged by: WDG	Checked by:		PI Meter: Porta FID
Screen: 5 (ft.)	Riser: (ft.)	Diam: 2" (ID)	Material: PVC
			Total Depth: 40'
			▽ Below Ground:
			Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
0–1						Brown fine Sand w/Silt	SM	P O S T			
1–8				NA (1), NA (3), 90 (5), 90 (7)	Ø, Ø, Ø, Ø	gray fine Sand	SP	H O L E, 4, 4, 5, 4, 5			
8–9				70	Ø	brown Fine Sand.	SP	3, 1, 1			
9–11						Tan Fine Sand	SP	2, 3, 3, 3			
11–13				50	Ø	WHITE FINE SAND	SP	3, 2, 4			
13–14				50	Ø	Brown Fine Sand	SP	5			
14–18				50 (15), 60 (17)	Ø, Ø	TAN FINE Sand	SP	1, 7, 8, 10, 3, 7, 9, 10			
18–22				80 (21)	Ø	Dark gray Fine Sand, trace med.	SP	3, 5, 7, 8, 3, 3, 6, 10			
22–24				90 (23)	Ø	See below		6, 12, 16, 20, 6, 12			

PROPORTIONS	(-) AMOUNT (-)	ABBREVIATIONS		
Trace (tr)	0-10%	f = fine	gr = gray	MS = Split Spoon
Little (li)	10-20%	m = medium	bn = brown	SW = Screened Auger
Some (so)	20-35%	c = coarse	blk = black	HP = Hydropunch
and	35-50%			

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08545.10
Date: 5-19-97
Sample Location ID: OLD-39-21B
Time: Start: 1255 End: 1615
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 27.20 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 14.04 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 13.16 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = [2.1 Gal/Vol; 15 Total Gal Purged]

Well Integrity: Yes / No
Prot. Casing Secure — NA
Concrete Collar Intact
Other

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm
Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 5 Gal.	@ 7.5 Gal.	@ 10 Gal.	@ 12.5 Gal.	@ 15 Gal.
Temperature, Deg. C	26.4	26.3	25.9	26.1	26.3
pH, units	5.60	5.65	5.59	5.62	5.59
Specific Conductivity	185	185	182	182	182
~~(umhos/cm @ 25 Deg. C)~~ NTU	127.0	113.0	106.3	98.3	91.1
Oxidation - Reduction, +/- mv	~	~	~	~	70.7
Dissolved Oxygen, ~~ppm~~	~	~	~	~	2.0 mg/l

Fe 0.7 mg/l
Fe²⁺ 0.6 mg/l
H_2S 0.7 mg/l
Cl^- 15 mg/l
CO_2 80 mg/l
ALK(Ph) Ø
ALK 50 mg/l

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
~~TRH~~		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

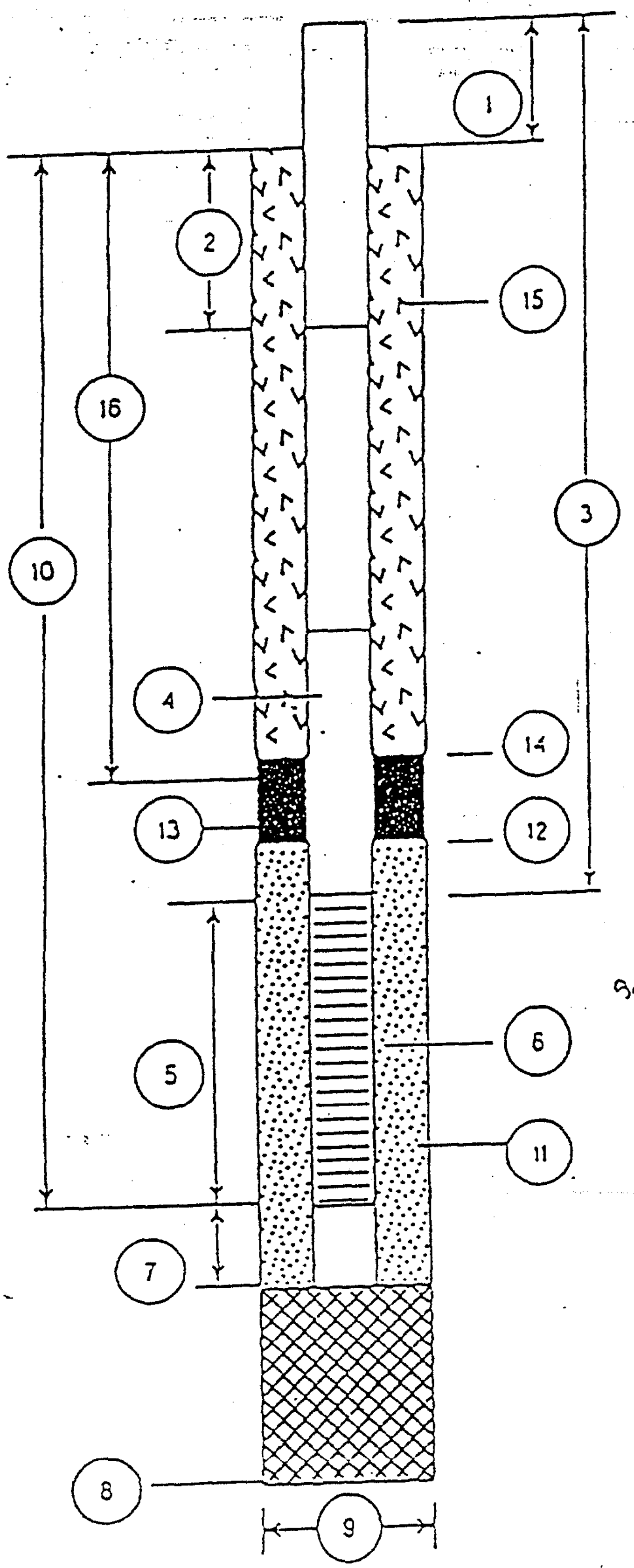
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL -

WELL NUMBER: AOD-39-21 B

DATE OF INSTALLATION: 4-22/97



1. Height of Casing above ground: FM
2. Depth to first Coupling: 3'

   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 23'
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 28.5
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 28'
11. Type of Screen Filter: Silica Sand

    Quantity Used: 250lb Size: 20/30
12. Depth to Top of Filter: 21'
13. Type of Seal: Fine Sand/Bentonite

    Quantity Used: 50lb/25lb
14. Depth to Top of Seal: 17'
15. Type of Grout: Neat Cement

    Grout Mixture: 94 lb Portland Cement / 8 lb Bentonite Gel / 8 gal water

    Method of Placement: Tremie
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-21/97
Sample Location ID: OLD-39-20A
Time: Start: 0830 End: 1130
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 17.12 Ft. — X Measured / ___ Historical — X Top of Well / ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 13.93 Ft.
Well Material: X PVC / ___ SS
Well Locked?: X Yes / ___ No
Well Dia.: X 2 inch / ___ 4 inch / ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe / ___ Float Activated / ___ Press. Transducer

Height of Water Column 3.19 Ft. X [X .16 Gal/Ft. (2 in.) / ___ .65 Gal/Ft. (4 in.) / ___ 1.5 Gal/Ft. (6 in.) / ___ Gal/Ft. (__ in.)] = [0.51 Gal/Vol; 6 Total Gal Purged]

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other — NA (Yes ___ No ___)

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

(✓ If Used For)

Decontamination Fluids Used: (✓ All That Apply at Location)
- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected ___ In-line X In Container

Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

H_2S 6mg/l
CO_2 60mg/l
Cl^- 10mg/l
Fe 0.4mg/l
Fe^{2+} 0.2mg/l
ALK (PTH) Ø
ALK 81.6mg/l

Purge Data	@ 2.5 Gal.	@ ___ Gal.	@ ___ Gal.	@ 5 Gal.	@ 6 Gal.
Temperature, Deg. C	25.1	25.6	26.4	26.5	26.9
pH, units	6.45	6.46	6.47	6.54	6.52
Specific Conductivity	320	320	322	320	320
(umhos/cm, @ 25 Deg. C) NTU	99.1	117.1	113.3	109.3	107.0
Oxidation - Reduction, +/- mv	—	—	—	—	255.2
Dissolved Oxygen, ppm	—	—	—	—	2.4 mg/l

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

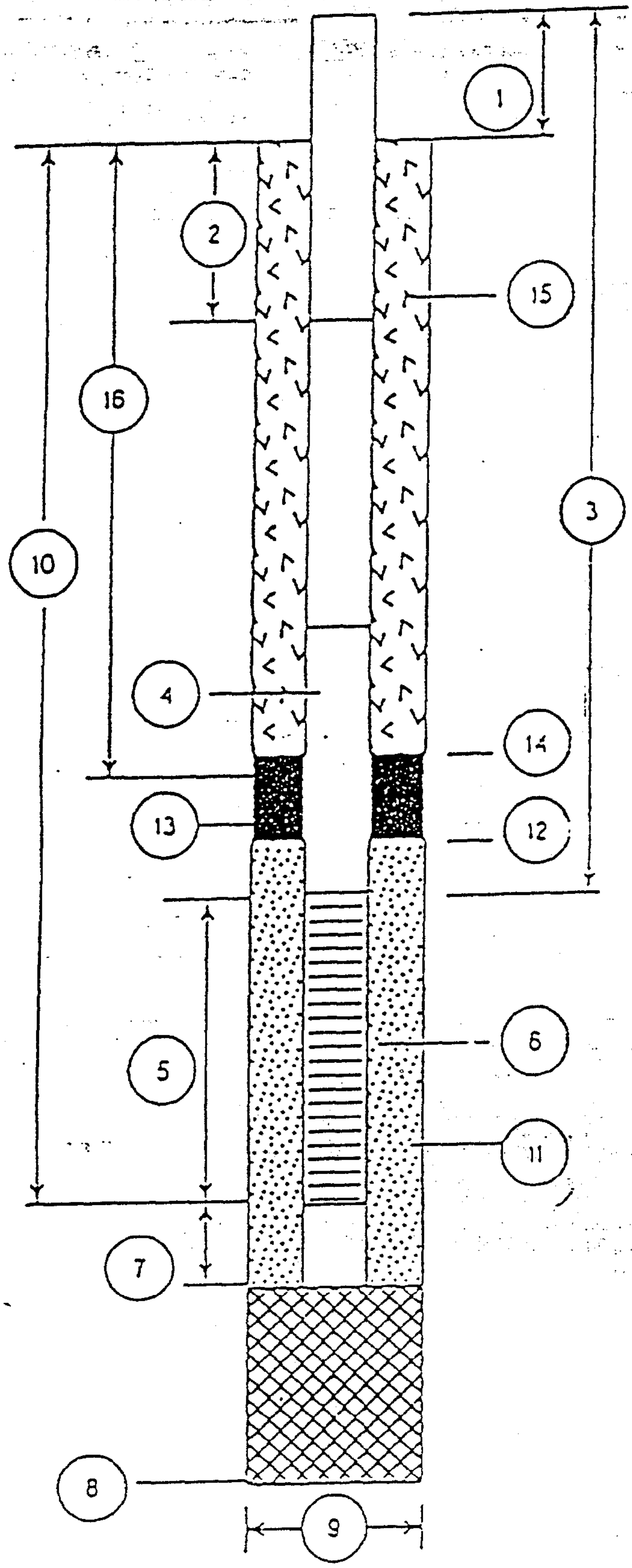
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD 39-20 A

DATE OF INSTALLATION: 4-21/9



1. Height of Casing above ground: FM
2. Depth to first Coupling: 7'
   Coupling Interval Depths: NA
3. Total Length of Riser Pipe: 7'
4. Type of Riser Pipe: 2" Sched. 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" Sched 40 PVC 0.010 Slot S
7. Length of Sump: 6"
8. Total Depth of Boring: 17'.5
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 17'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 450lb Size: 20/30
12. Depth to Top of Filter: 5'
13. Type of Seal: Fine Sand/Bentonite
    Quantity Used: 50lb/25lb
14. Depth to Top of Seal: 2'
15. Type of Grout: Neat Cement
    Grout Mixture:
    Method of Placement: Pour
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08543.10
Date: 5-22/98
Sample Location ID: OLD-39-19C
Time: Start: 1410 End: 1715
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 49.80 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up (from ground) NA Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 14.08 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 35.72 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 5.8 Gal/Vol

21 Total Gal Purged

Well Integrity: Yes No
Prot. Casing Secure NA
Concrete Collar Intact
Other

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm

Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid ___ Colored ___ Clear ___ Odor X Cloudy

Purge Data	@ 5 Gal.	@ 10 Gal.	@ 15 Gal.	@ 20 Gal.	@ 21 Gal.
Temperature, Deg. C	26.5	28.2	27.2	26.9	26.5
pH, units	5.59	5.15	5.14	5.12	5.18
Specific Conductivity	148	105	100	96	96
~~(umhos/cm @ 25 Deg. C)~~ NTU	220.0	147.3	154.2	152.0	146.9
Oxidation - Reduction, +/- mv					61.4
Dissolved Oxygen, ~~ppm~~	—	—	—	~	0.86 mg/l

Cl^- 20 mg/l
CO_2 50 mg/l
Fe 1.1 mg/l
H_2S 5 mg/l
Fe^{2+} 0.9 mg/l
ALK = 40.8

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

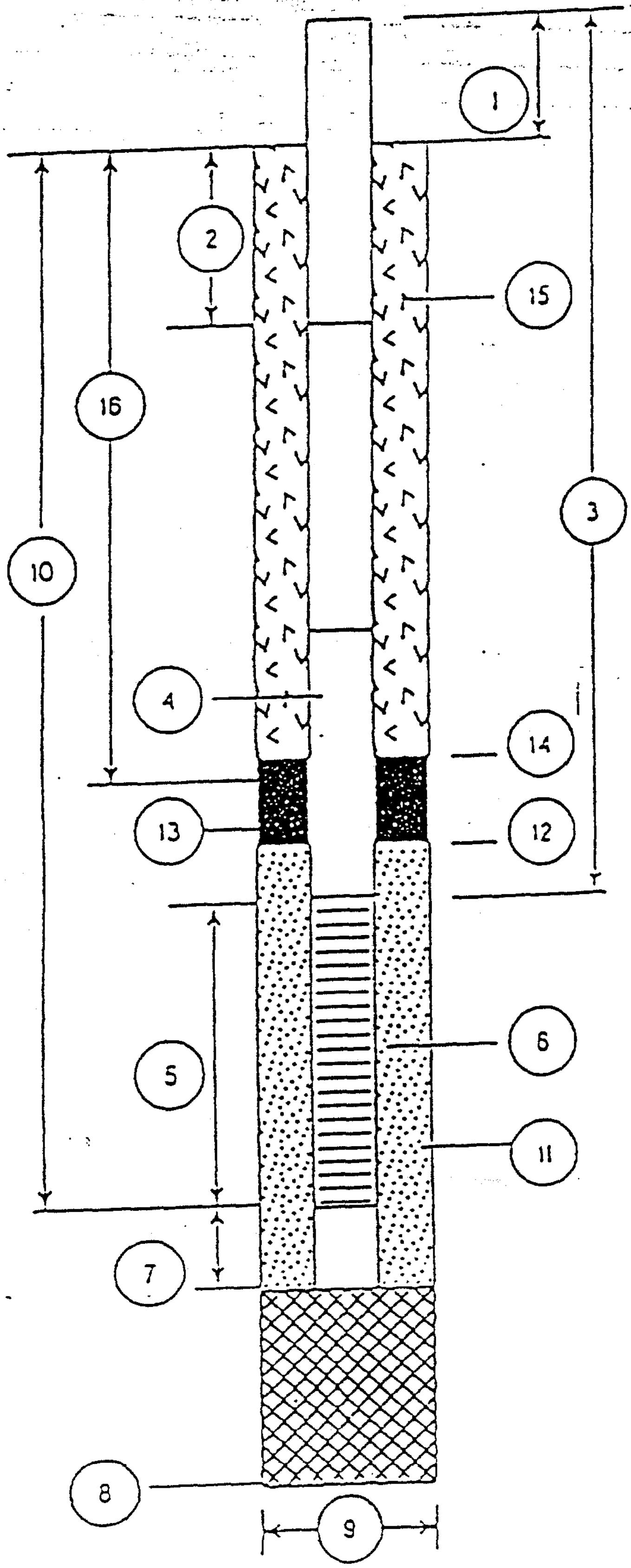
NAVAL FACILITIES ENGINEERING COMMAND

CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-19C

DATE OF INSTALLATION: 5-2/9



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5'

   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 45'
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 50'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 50'
11. Type of Screen Filter: Silica Sand

    Quantity Used: 75 lb   Size: 20/30
12. Depth to Top of Filter: 43'
13. Type of Seal: fine sand/Bentonite

    Quantity Used: ____
14. Depth to Top of Seal: 29'
15. Type of Grout: Neat cement

    Grout Mixture:

    Method of Placement: tremie
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 31'

SOIL BORING LOG

Client: South Div	Project No. 08545.10
Contractor: CDS	Date Started: 4-30/97
Method: HSA / Rotary	Casing Size: 15" / 6"
Ground Elev.:	Soil Drilled: 50'
Logged by: WDO	Checked by: PGM
Screen: 5 (ft.) | Riser: 45 (ft.)	Diam: 2 (ID) | Material: PVC

Point of Interest:	SA39
Boring No.:	OLD-39-19C
Protection:	D
Completed:	5-2/97
PI Meter:	Porta-FID
Total Depth:	50'
▽ Below Ground:	
Page	2 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
26											
27				50	Ø	See above					
28											
29				60	Ø						
30						brown silty clay, hard trace fine sand, non plastic	CL				
31											
32						med. brown clayey silt	ML				
33				70	Ø						
34											
35				60	Ø	Light brown silty sand	SM				
36											
37				70	Ø						
38											
39				70	Ø						
40											
41				80	Ø						
42											
43				50	Ø						
44											
45				60	Ø						
46						green silty sand soft	SM				
47				70	Ø						
48											
49				80	Ø						
50											

PROPORTIONS	(-) AMOUNT (+)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	MS = Split Spoon
m = medium	bn = brown	SW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

SOIL BORING LOG

Client: South DIV	Project No. 08545.10	Point of Interest: SA 39
Contractor: CDS	Date Started: 4-30/97	Boring No.: OLD-39-MC
Method: HSA/Rotary	Casing Size: 15" / 6"	Protection: D
Ground Elev.:	Soil Drilled: 50'	Completed: 5-2/97
Logged by: WDO	Checked by: PGM	PI Meter: Porta-FID
Screen: 5 (ft.)	Riser: 45 (ft.)	Total Depth: 50'
Diam: 2 (ID)	Material: PVC	▽ Below Ground:
		Page 1 of: 2

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
1				NA	∅	Gray brown fine sand, trace silt, some lime rock	SP	P, 0			
2								5, 7			
3				NA	∅	grades to		4, 0			
4								5, 5			
5				80	∅	Offwhite fine sand, mottled w/black silt in thin laminae	SP	1, 5			
6								5, 6			
7				80	∅			3, 3			
8						grades to		3, 2			
9				90	∅	brown fine sand		1, 2			
10								1, 2			
11				50	∅			1, 3			
12								5, 3			
13				80	∅	silty sand layers 19-22'	SP	6, 1			
14								2, 2			
15				90	∅			3, 7			
16								10, 14			
17				80	∅			3, 6			
18								12, 16			
19				80	∅			1, 13			
20								24, 1			
21				80	∅			6, 26			
22								28, 20			
23				60	∅			3, 10			
24				80	∅			29, 19, 3, 10			

PROPORTIONS	(-) AMOUNT (+)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	MS = Split Spoon
m = medium	bn = brown	SW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08543,10
Date: 5-21/97
Sample Location ID: OLD-39-18B
Time: Start: 1405 End: 1610
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 27.10 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up NA Ft. (from ground)
Protective NA Ft. Casing/Well Difference
Protective Casing NA Ft.

Depth to Water 13.38 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 13.72 Ft. X
X .16 Gal/Ft. (2 in.)
___ .65 Gal/Ft. (4 in.)
___ 1.5 Gal/Ft. (6 in.)
___ Gal/Ft. (__ in.)
= 2.2 Gal/Vol
13 Total Gal Purged

Well Integrity:		Yes	No
Prot. Casing Secure	NA		
Concrete Collar Intact			
Other			

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon ~~Coated~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid ___ Colored ___ Clear ___ Odor X Cloudy

H_2S 0.5mg/L
CO_2 100mg/L
ALK 34mg/L
Cl^- 35mg/L
Fe 0.5mg/L
Fe^{2+} 0.4mg/L

Purge Data	@ ___ Gal.	@ ___ Gal.	@ 10 Gal.	@ ___ Gal.	@ 13 Gal.
Temperature, Deg. C	27.0	26.9	27.1	26.9	26.8
pH, units	5.50	5.62	5.51	5.45	5.44
Specific Conductivity	200	200	200	205	200
~~(umhos/cm @ 25 Deg. C)~~ NTU	26.9	23.3	18.78	20.6	19.70
Oxidation - Reduction, +/- mv	—	—	—	—	107.3
Dissolved Oxygen, ~~ppm~~					1.08mg/L

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4oC			/ / /
Pest/PCB		4oC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TRH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

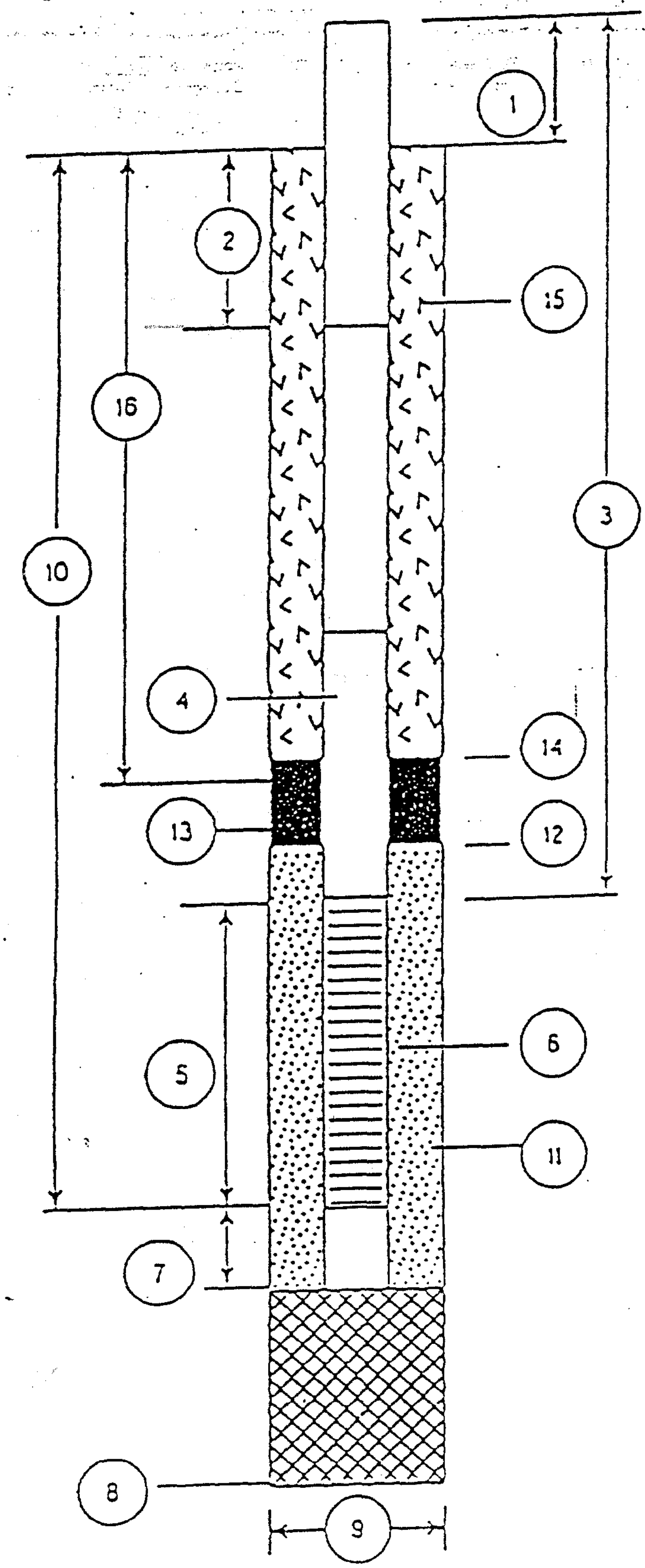
Notes:

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

CHARLESTON, SC.



WELL CONSTRUCTION DETAIL

WELL NUMBER: 04)-39-18B

DATE OF INSTALLATION: 4-23,

1. Height of Casing above ground: FM
2. Depth to first Coupling: 3'

   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 23'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 28'
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 28"
11. Type of Screen Filter: Silica sand

    Quantity Used: ____ Size: 20/3
12. Depth to Top of Filter: 21
13. Type of Seal: fine Sand/Bentonite

    Quantity Used: ____
14. Depth to Top of Seal: 17'
15. Type of Grout: Neat Cement

    Grout Mixture:

    Method of Placement: Tremie
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08545.10
Date: 5-21/97
Sample Location ID: OLD-39-17A
Time: Start: 1155 End: 1405
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 16.92 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up NA Ft. (from ground)

Protective NA Ft. Casing/Well Difference

Protective Casing NA Ft.

Depth to Water 13.33 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 3.59 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 0.54 Gal/Vol; 4 Total Gal Purged

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other — NA (Yes / No)

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Φ ppm Well Mouth Φ ppm

Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ 4 Gal.
Temperature, Deg. C	28.5	28.3	27.8	27.3	27.1
pH, units	6.37	6.54	6.66	6.64	6.63
Specific Conductivity	449	440	435	432	430
~~(umhos/cm. @ 25 Deg. C)~~ NTU	13.98	5.03	4.22	3.78	3.43
Oxidation - Reduction, +/- mv	—	—	—	—	177.1
Dissolved Oxygen, ~~ppm~~	—	—	—	—	1.2 mg/l

CO_2 50mg/l
Cl^- 15mg/l
Fe 0.2mg/l
H_2S 6mg/l
Fe^{2+} 0.2mg/l
ALK(Ph) Φ
ALK = 93.5

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

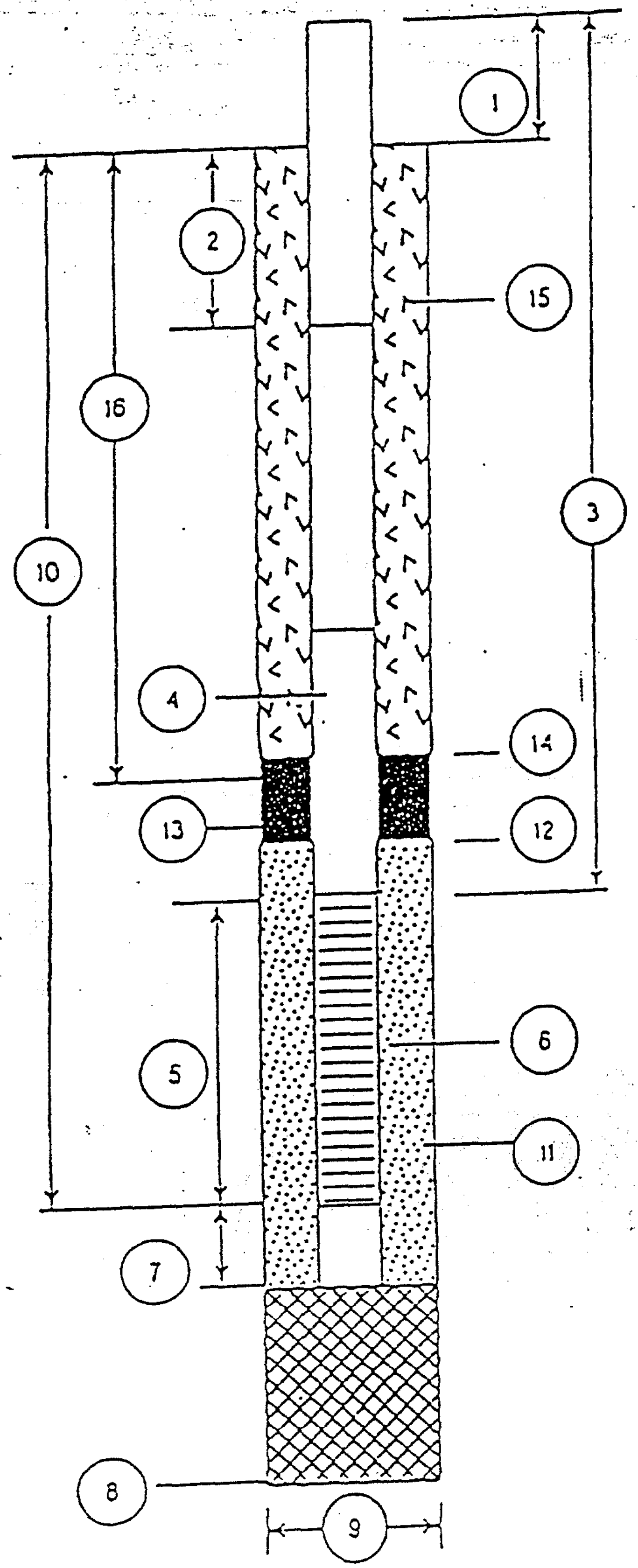
NAVAL FACILITIES ENGINEERING COMMAND

CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-17A

DATE OF INSTALLATION: 4-22/97



1. Height of Casing above ground: FM
2. Depth to first Coupling: 7'

   Coupling Interval Depths: NA
3. Total Length of Riser Pipe: 7'
4. Type of Riser Pipe: 2" Sched 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" Sched 40 PVC 0.010 Slot
7. Length of Sump: 6"
8. Total Depth of Boring: 17.5
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 17'
11. Type of Screen Filter: Silica Sand

    Quantity Used: 450lb Size: 20/30
12. Depth to Top of Filter: 5'
13. Type of Seal: Fine Silica Sand / Bentonite

    Quantity Used: 50Lb/25lb
14. Depth to Top of Seal: 2'
15. Type of Grout: Neat cement

    Grout Mixture:

    Method of Placement: Apron
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-22-97
Sample Location ID: OLD-39-16C
Time: Start: 0814 End: 1045
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 40.80 Ft. — X Measured / Historical — X Top of Well / Top of Protective Casing

Well Riser Stick-up (from ground) NA Ft.

Protective Casing/Well Difference NA Ft.

Protective Casing NA Ft.

Depth to Water 12.46 Ft.

Well Material: X PVC / SS

Well Locked?: X Yes / No

Well Dia. X 2 inch / 4 inch / 6 inch

Water Level Equip. Used: X Elect. Cond. Probe / Float Activated / Press. Transducer

Height of Water Column 28.34 Ft. X [X .16 Gal/Ft. (2 in.) / .65 Gal/Ft. (4 in.) / 1.5 Gal/Ft. (6 in.) / Gal/Ft. (in.)] = 4.5 Gal/Vol; 24 Total Gal Purged

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other — Yes / No: NA

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)

- Methanol (100%)
- 25% Methanol/75% ASTM Type II water
- X Deionized Water
- Liquinox Solution
- Hexane
- HNO_3/D.I. Water Solution
- Potable Water
- None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm Field Data Collected: In-line / X In Container

Sample Observations: X Turbid / Clear / Cloudy / Colored / Odor

Purge Data	@ Gal.	@ 20 Gal.	@ Gal.	@ Gal.	@ 24 Gal.
Temperature, Deg. C	26.0	26.1	25.9	26.0	26.1
pH, units	5.34	5.36	5.31	5.22	5.24
Specific Conductivity	120	113	110	109	108
~~(umhos/cm @ 25 Deg. C)~~ mV	82.2	74.2	67.3	63.8	61.3
Oxidation - Reduction, +/- mv	—	—	—	—	40.7 mg/l
Dissolved Oxygen, ~~ppm~~	—	—	—	—	1.08 mg/l

CO_2 65 mg/l
H_2S 5.0 mg/l
Cl^- 15 mg/l
ALK 34 mg/l
Fe 0.9 mg/l
Fe^{2+} 0.8 mg/l

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

Notes:

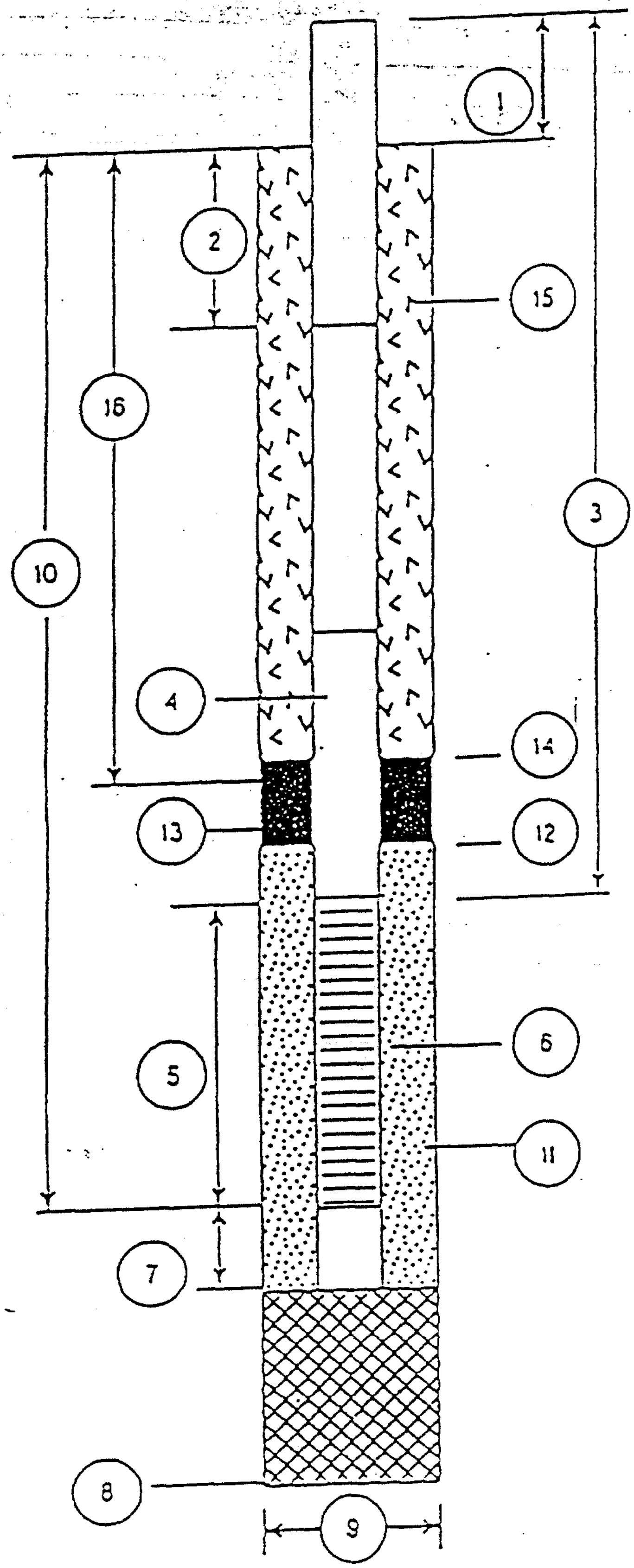
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-16C

DATE OF INSTALLATION: 5-3/6



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 35'
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 40'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 40'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 150 lb   Size: 20/30
12. Depth to Top of Filter: 27
13. Type of Seal: fine Sand/Bentonite
    Quantity Used: 25 lb/30 lb
14. Depth to Top of Seal: 23
15. Type of Grout: Neat cement
    Grout Mixture:
    Method of Placement: Tremie
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 25'

SOIL BORING LOG

Client: South DiV	Project No. 08545.10	Point of Interest: SA 39	
Contractor: CDS	Date Started: 4-30/97	Boring No.: OLD-39-16	
Method: HSA/Rotary	Casing Size: 15" / 6"	Protection: D	
Ground Elev.:	Soil Drilled: 40	Completed: 5-3/97	
Logged by: PGM	Checked by: WDO	PI Meter: Porta-Fid	
Screen: 5 (ft.)	Riser: 35 (ft.)	Diam: 2 (ID)	Material: PVC
Total Depth: 40	Below Ground:	Page 2 of: 2	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
						dark brown hard silt to clayey silt w/sand, non plastic		25			
26								25, 50			
27				10	Ø		ML	-, -			
28						Light brown silty sand sandier w/depth		14, 12			
29				70	Ø			13, 7			
30							SM	5, 6			
31				90	Ø			7, 7			
32								2, 2			
33				50	Ø			2, 4			
34								2, 3			
35				50	Ø			4, 5			
36								5, 5			
37				50	Ø			7, 6			
38								4, 6			
39				70	Ø			6, 8			
40						TD = 40'					

PROPORTIONS	(-) AMOUNT (+)	ABBREVIATIONS		
Trace (tr)	0-10%	f = fine	gr = gray	MS = Split Spoon
Little (li)	10-20%	m = medium	bn = brown	SW = Screened Auger
Some (so)	20-35%	c = coarse	blk = black	HP = Hydropunch
and	35-50%			

SOIL BORING LOG

Client: South Div	Project No. 08545.10	Point of Interest: SA39	
Contractor: CDS	Date Started: 4/30/97	Boring No.: OLD-39-16	
Method: HSA / Rotary	Casing Size: 15" / 6"	Protection: D	
Ground Elev.:	Soil Drilled: 40	Completed: 5-3/97	
Logged by: PGM	Checked by: WDO	PI Meter: Porta-FID	
Screen: 5 (ft.)	Riser: 35 (ft.)	Diam: 2" (ID)	Material: PVC
Total Depth: 40	▽ Below Ground:	Page 1 of: 2	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
1											
2						See log for OLD-39-04					
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18								6, 16			
19				70	Ø	Dark brown fine sand trace silt	SP	36, –			
20								3, 5			
21				80	Ø			16, 28			
22								4, 15			
23				80	Ø	hard brown sandy silt, fine sand nonplastic dry	ML	50, –			
24				50	Ø	dark Brown fine sand w/silt	SM	15, 40			

PROPORTIONS	(-) AMOUNT (-)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	MS = Split Spoon
m = medium	bn = brown	BW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA39
Project Number: 08545.10
Date: 5.22/97
Sample Location ID: OLD-39-13B
Time: Start: 1055 End: 1236
Signature of Sampler: [illegible]

Water Level/Well Data

Well Depth 24.72 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up (from ground) NA Ft.
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 12.16 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 12.56 Ft. X
X .16 Gal/Ft. (2 in.)
___ .65 Gal/Ft. (4 in.)
___ 1.5 Gal/Ft. (6 in.)
___ Gal/Ft. (__ in.)
= 1.97 Gal/Vol
7 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure		
Concrete Collar Intact NA		
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

Purging (✓ If Used For)	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
- ___ Methanol (100%)
- ___ 25% Methanol/75% ASTM Type II water
- X Deionized Water
- ___ Liquinox Solution
- ___ Hexane
- ___ HNO_3/D.I. Water Solution
- ___ Potable Water
- ___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm
Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid ___ Colored X Clear ___ Odor ___ Cloudy

H_2S 0.7 mg/l
CO_2 100 mg/l
ALK 34 mg/l
Cl^- 20 mg/l
Fe 1.0 mg/l
Fe^{2+} 0.9 mg/l

Purge Data	@ ___ Gal.	@ 2.5 Gal.	@ 4.5 Gal.	@ 5.5 Gal.	@ 7 Gal.
Temperature, Deg. C	—	25.0	25.0	25.0	25.0
pH, units		5.37	5.33	5.30	5.32
Specific Conductivity ~~(umhos/cm @ 25 Deg. C)~~ NTU	135 / 9.43	185 / 11.61	188 / 8.52	185 / 11.44	185 / 17.10
Oxidation - Reduction, +/- mv	—	—	—	—	138.4
Dissolved Oxygen, ~~ppm~~	—	—	—	—	0.89 mg/l

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4C			/ / /
Pest/PCB		4C			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

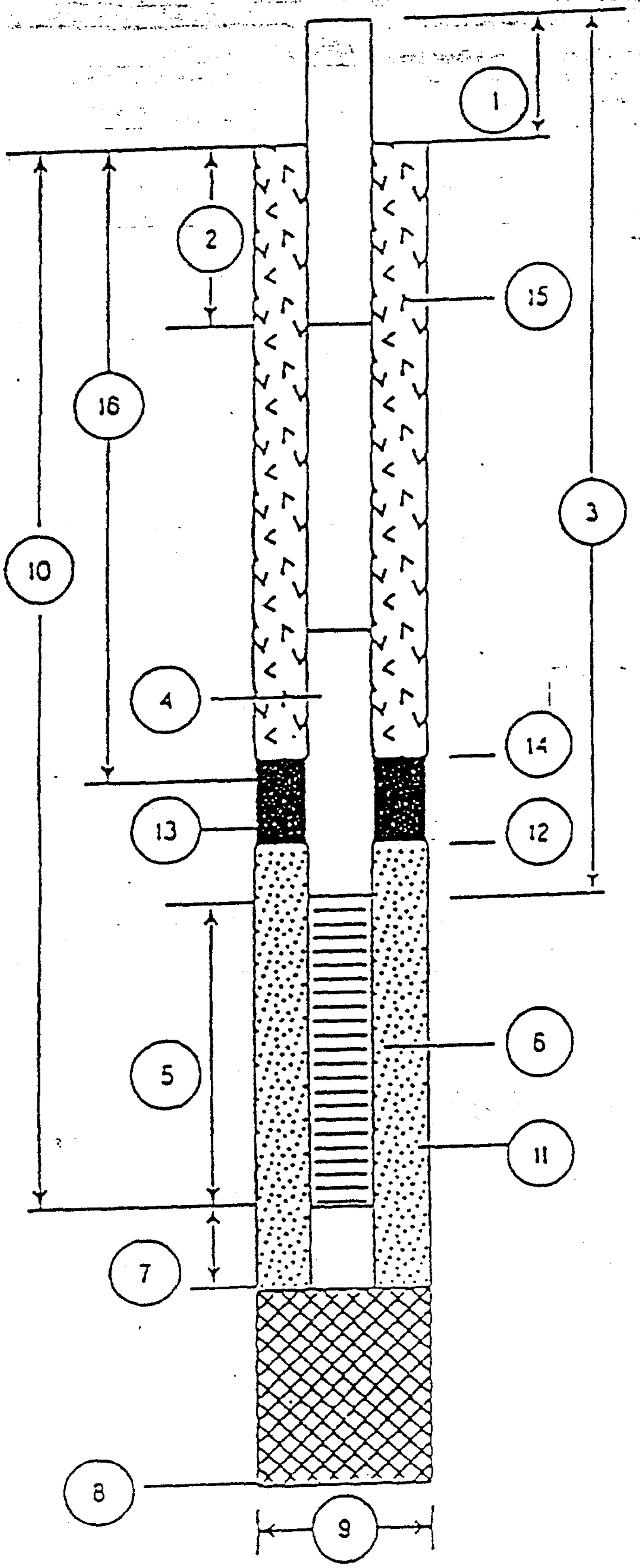
Notes:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-15B

DATE OF INSTALLATION: 4-22



1. Height of Casing above ground: FM
2. Depth to first Coupling: 10'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 20'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 25'
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 25'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 300 lb Size: 20/
12. Depth to Top of Filter: 18'
13. Type of Seal: fine sand/ bentonite
    Quantity Used: 50 lb/ 25 lb
14. Depth to Top of Seal: 14'
15. Type of Grout: Neat Cement
    Grout Mixture:
    Method of Placement: Tremie
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Project Number: 08545.10
Sample Location ID: OLD-39-14C
Time: Start: 0945 End: 1255

Point of Interest: SA39
Date: 5-14/97
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 39.52 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up NA Ft. (from ground)

Protective NA Ft. Casing/Well Difference

Protective NA Ft. Casing

Depth to Water 13.56 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 25.96 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 4.15 Gal/Vol; 21 Total Gal Purged

Well Integrity: (Yes / No)
Prot. Casing Secure ___ ___
Concrete Collar Intact NA ___ ___
Other ___

Equipment Documentation

Purging/Sampling Equipment Used:

Purging	Sampling	Equipment	Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

(✓ If Used For)

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm

Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 14 Gal.	@ 16 Gal.	@ 19 Gal.	@ 20 Gal.	@ 21 Gal.
Temperature, Deg. C	26.5	26.5	26.7	26.6	26.7
pH, units	5.51	5.56	5.42	5.56	5.52
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	70	70	70	69	69
Oxidation - Reduction, +/- mv					73.5
Dissolved Oxygen, ppm					

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / / ALK (P1h) ∅
SVOA		4oC			/ / / ALK Total 34 mg/l
Pest/PCB		4oC			/ / / CL- 15 mg/l
Inorganics		HNO_3			/ / / CO_2 50 mg/l
Explosives		4°C			/ / / Fe- 1 mg/l
TPH		H_2SO_4			/ / / H_2S 0.5 mg/l
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

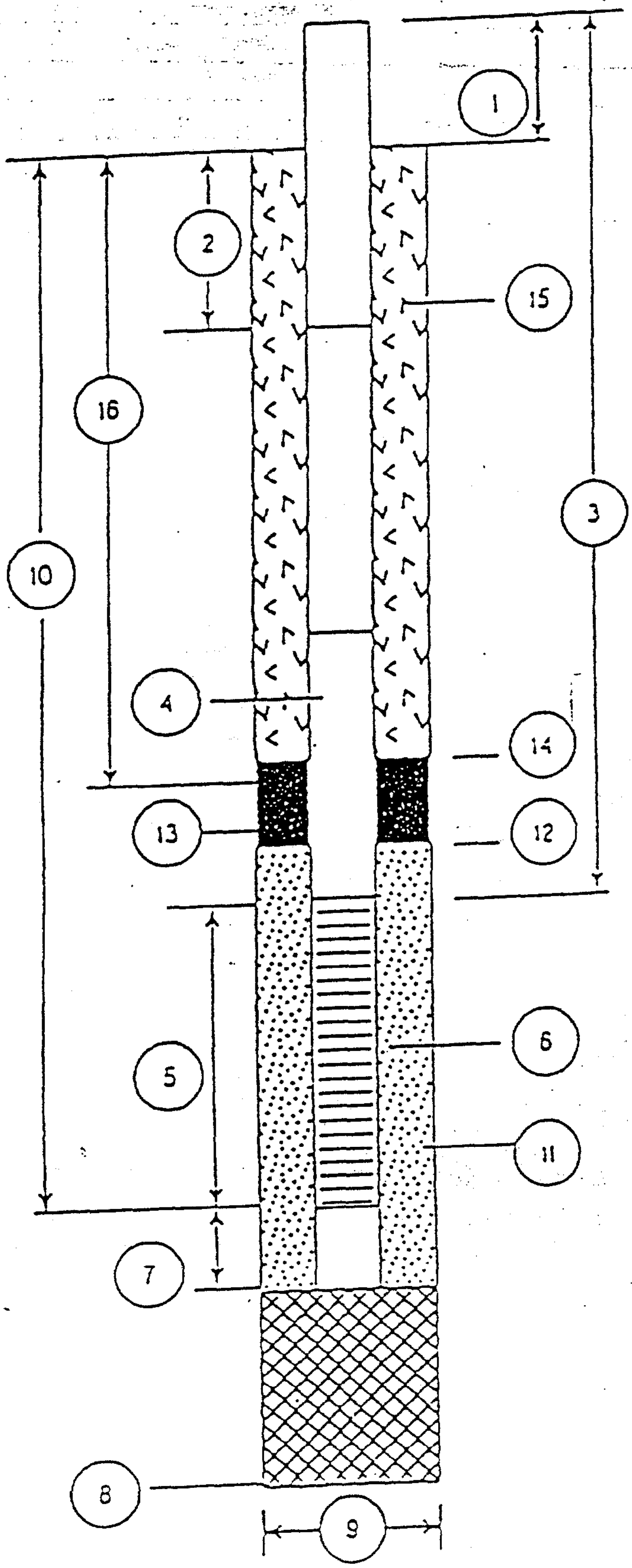
Notes:

WELL CONSTRUCTION DETAIL

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL NUMBER: OLD-39-14C

DATE OF INSTALLATION: 5-1/c



1. Height of Casing above ground: FM
2. Depth to first Coupling: 5'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 35'
4. Type of Riser Pipe: 2" Sched. 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" Sched. 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 40'
9. Diameter of Boring: 14"/6"
10. Depth to Bottom of Screen: 40'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 75 lb   Size: 20/3
12. Depth to Top of Filter: 33'
13. Type of Seal: fine sand / bentonite
    Quantity Used: 25 lb / 30 lb
14. Depth to Top of Seal: 29'
15. Type of Grout: Neat cement
    Grout Mixture:
    Method of Placement: 50 gal
16. Tot. Depth of 6 in. ~~Steel~~ PVC Casing: 31'

SOIL BORING LOG

Client: South DIV	Project No. 08545.10
Contractor: CDS	Date Started: 4-24/97
Method: HSA / Rotary	Casing Size: 15" / 6"
Ground Elev.:	Soil Drilled: 40'
Logged by: WDO	Checked by:
Screen: 5 (ft.)	Riser: (ft.)
Diam: 2" (ID)	Material: PVC

Point of Interest:	SA-39
Boring No.:	OLD-39-14
Protection:	D
Completed:	5-1/97
PI Meter:	PortaFID
Total Depth:	40'
▽ Below Ground:	
Page 2 of:	

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP/SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	WELL DATA	LITHOLOGY	ELEVATION (FT.)
26				80	Ø	Brown fine sand w/silt, slightly cohesive	SM			
27				90	Ø	brown sand and clay, fine sand, cohesive, clay lenses @ 27.5 and 28.5 ft	SC			
28										
29				90	Ø					
30										
31				90	Ø	brown clay, trace fine sand, stiff	CL			
32						lt brown sandy clay	SC			
33				50	Ø	Tan medium sand, some silt and fine sand, brown mottling @ 37 ft and below	SP			
34										
35				50	Ø					
36										
37				50	Ø					
38										
39				50	Ø					
40										

BLOWS/6-IN. (in order, top to bottom): 21, 27, 3, 6, 16, 30, 9, 16, 15, 12, 8, 10, 10, 12, 4, 7, 9, 10, 7, 10, 13, 15, 8, 9, 10, 14, 7, 8, 14, 16

PROPORTIONS	(-) AMOUNT (+)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine	gr = gray	MS = Split Spoon
m = medium	bn = brown	SW = Screened Auger
c = coarse	blk = black	HP = Hydropunch

SOIL BORING LOG

Client: South DIV	Project No. 08545.10
Contractor: CDS	Date Started: 4-24/97
Method: HSA/Rotary	Casing Size: 15"/6"
Ground Elev.:	Soil Drilled: 40'
Logged by: WDO	Checked by:
Screen: 5 (ft.) / Riser: 35 (ft.) / Diam: 2" (ID)	Material: PVC

Point of Interest: SA-39
Boring No.: OLD-39-14
Protection: D
Completed: 5-1/97
PI Meter: Porta FID
Total Depth: 40'
Below Ground:
Page 1 of:

DEPTH (FT)	SAMPLE NUMBER	SAMPLE DEPTH	CLP SCREENING	RECOVERY	PID (ppm)	SOIL/ROCK DESCRIPTION	SOIL CLASS	BLOWS/6-IN.	WELL DATA	LITHOLOGY	ELEVATION (FT.)
1–2				NA	Ø	Gray brown fine Sand, some Limerock and concrete debris	SP				
3				NA	Ø						
3–5				60	Ø	Dark Brown fine Sand, trace silt	SP				
7				70	Ø						
9				70	Ø						
11				80	Ø						
12–13				60	Ø	off white/gray Fine Sand, moist/wet, loose	SP				
15				80	Ø	gray/brown fine Sand, trace loose Sand	SP				
17				100	Ø						
19				90	Ø						
21				90	Ø						
23				50	Ø	light gray fine Sand 1" stringer of white fine Sand @ 24.5 Ft	SP				

PROPORTIONS

PROPORTIONS	(-) AMOUNT (-)
Trace (tr)	0-10%
Little (li)	10-20%
Some (so)	20-35%
and	35-50%

ABBREVIATIONS

f = fine
m = medium
c = coarse
gr = gray
bn = brown
blk = black
MS = Split Spoon
SW = Screened Auger
HP = Hydropunch

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-13/97
Sample Location ID: OLD-39-13B
Time: Start: 1612 End: 1855
Signature of Sampler: W. P. Olsen

Water Level/Well Data

Well Depth 27.90 Ft. X Measured ___ Historical
X Top of Well ___ Top of Protective Casing
Well Riser Stick-up (from ground) NA Ft.
Protective Casing/Well Difference NA Ft.
Protective Casing NA Ft.

Depth to Water 13.24 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. X 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 14.66 Ft. X
X .16 Gal/Ft. (2 in.)
___ .65 Gal/Ft. (4 in.)
___ 1.5 Gal/Ft. (6 in.)
___ Gal/Ft. (__in.)
= 2.35 Gal/Vol
8 Total Gal Purged

Well Integrity: Yes No
Prot. Casing Secure
Concrete Collar Intact NA
Other

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
X Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC Ø ppm Well Mouth Ø ppm
Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ 8 Gal.
Temperature, Deg. C	25.3	25.6	25.5	25.4	25.2
pH, units	5.24	5.13	5.07	5.06	5.05
Specific Conductivity ~~(umhos/cm @ 25 Deg. C)~~	38	48	52	52	55
Oxidation - Reduction, +/- mv					176.0
Dissolved Oxygen, ppm					

Sample Collection Requirements (✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / / ALK (Fld)
SVOA		4°C			/ / / ALK total 34 mg/l
Pest/PCB		4°C			/ / / H_2S 0.5 mg/l
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / / Fe^{2+} 0.1 mg/l
TPH		H_2SO_4			/ / / Fe 0.3 mg/l
TOC		H_2SO_4			/ / / Cl
Nitrate/Nitrite		H_2SO_4			/ / / CO_2

Sulfate
Notes:

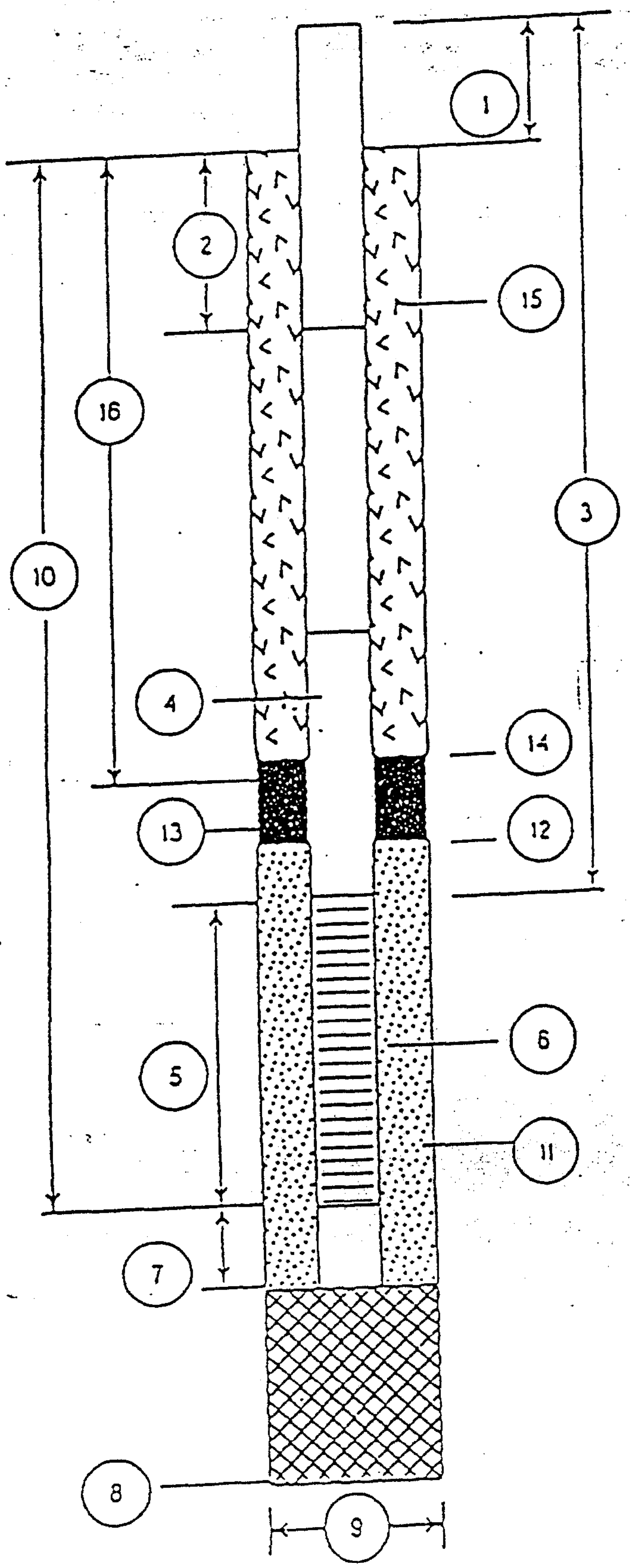
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-13B

DATE OF INSTALLATION: 4-22/9



1. Height of Casing above ground: FM
2. Depth to first Coupling: 3'
   Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 23'
4. Type of Riser Pipe: 2" sched 40 PVC
5. Length of Screen: 5'
6. Type of Screen: 2" Sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 28.5
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 28'
11. Type of Screen Filter: Silica Sand
    Quantity Used: 300 lb   Size: 20/30
12. Depth to Top of Filter: 21'
13. Type of Seal: Fine Sand / Bentonite
    Quantity Used: 50 lb/25 lb
14. Depth to Top of Seal: 17'
15. Type of Grout: Neat cement
    Grout Mixture: 94 lb Portland cement / 8 lb Bentonite Gel / 8 gal water
    Method of Placement: Tremie
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: NTC ORLANDO
Point of Interest: SA 39
Project Number: 08545.10
Date: 5-13/97
Sample Location ID: OLD-39-12A
Time: Start: 1345 End: 1605
Signature of Sampler: [signature]

Water Level/Well Data

Well Depth 16.80 Ft. X Measured ___ Historical

X Top of Well ___ Top of Protective Casing

Well Riser Stick-up NA Ft. (from ground)

Protective NA Ft. Casing/Well Difference

Protective NA Ft. Casing

Depth to Water 13.38 Ft.

Well Material: X PVC ___ SS

Well Locked?: X Yes ___ No

Well Dia. X 2 inch ___ 4 inch ___ 6 inch

Water Level Equip. Used: X Elect. Cond. Probe ___ Float Activated ___ Press. Transducer

Height of Water Column 3.42 Ft. X [X .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.)] = 0.55 Gal/Vol ___ Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure		
Concrete Collar Intact		
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
X	X	Peristaltic Pump	
		[illegible]	
		PVC/Silicon Tubing	
X	X	Teflon/~~Silicon~~ Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ [illegible]
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

Field Analysis Data

Ambient Air VOC ∅ ppm Well Mouth ∅ ppm Field Data Collected ___ In-line X In Container

Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.	@ ___ Gal.
Temperature, Deg. C		26.8	26.5	27.1	26.9
pH, units		6.26	6.34	6.41	6.39
Specific Conductivity (umhos/cm. @ 25 Deg. C.)		210	210	210	208
Oxidation - Reduction, +/- mv					+163.8
Dissolved Oxygen, ppm					

H_2S = 0.1 mg/l
Fe = < 0.1 mg/l
Cl⁻ = < 5 mg/l
CO_2 = < 1.25 mg/l
ALK (Ph) = ∅
ALK (total) 119 m
DO = 7 mg/l

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL	3X40ml	✓	
~~SVOA~~		4°C			
~~Pest/PCB~~		4°C			
~~Inorganics~~		HNO_3			
~~Explosives~~		4°C			
~~TPH~~		H_2SO_4			
TOC		H_2SO_4	1X250 ml	X	
Nitrate /Nitrite/ Sulfate		~~[illegible]~~	1X1l	X	

Notes:
methane - 2X40ml
Sulfide - 1X1l w/ZnAc & NaOH

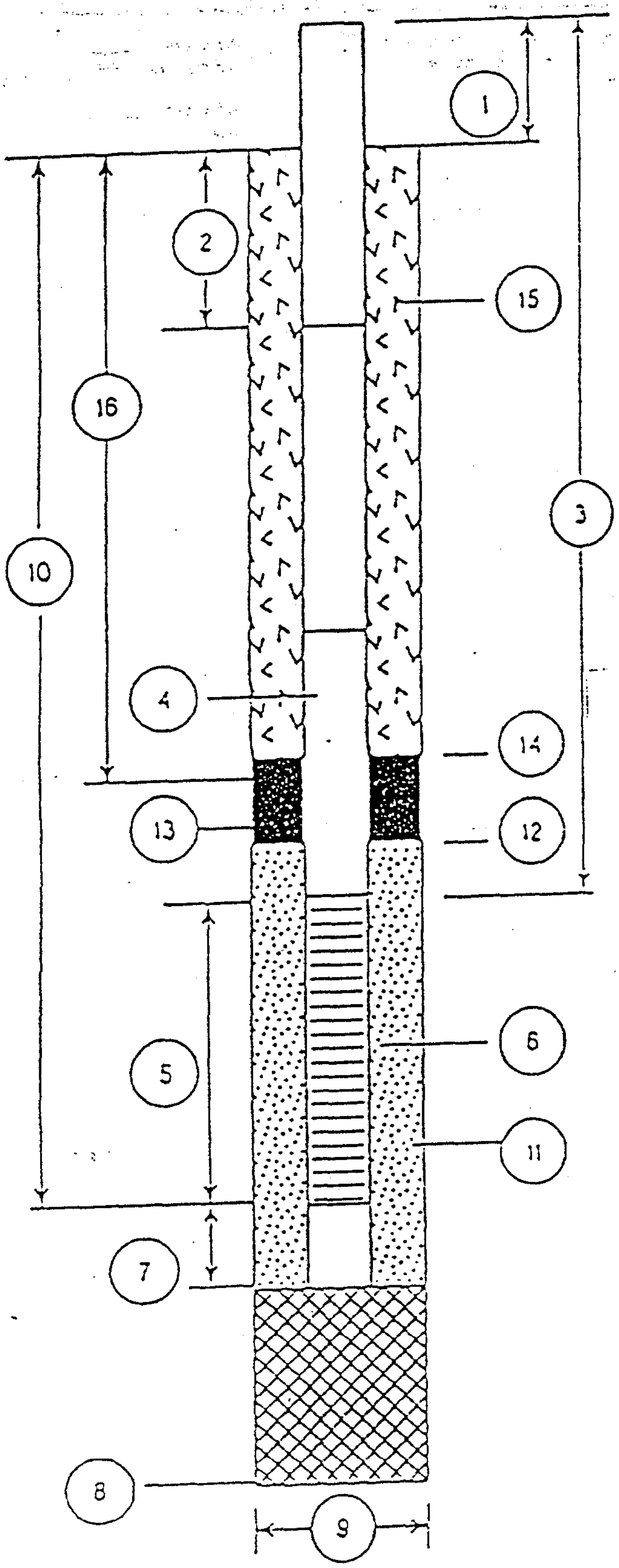
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-39-12 A

DATE OF INSTALLATION: 4-21/97



1. Height of Casing above ground: FM
2. Depth to first Coupling: 7'

   Coupling Interval Depths: NA
3. Total Length of Riser Pipe: 7'
4. Type of Riser Pipe: 2" sched. 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" sched 40 PVC 0.010 slot
7. Length of Sump: 6"
8. Total Depth of Boring: 17.5'
9. Diameter of Boring: 10"
10. Depth to Bottom of Screen: 17'
11. Type of Screen Filter: Silica sand

    Quantity Used: 400lb Size: 20/30
12. Depth to Top of Filter: 5'
13. Type of Seal: FINE SAND/Bentonite

    Quantity Used: 50lb/25lb
14. Depth to Top of Seal: 2'
15. Type of Grout: Neat Cement

    Grout Mixture:

    Method of Placement: Pour
16. Tot. Depth of 6 in. Steel Casing: NA

GROUNDWATER SAMPLE FIELD DATA

Project: SA 39 SUPP SCREENING   Point of Interest: OLD-39-11
Project Number: 8579.10   Date: 11/26-96
Sample Location ID: OLD-39-11
Time: Start: 1449   End: 1535   Signature of Sampler:

Water Level/Well Data

Well Depth 17 Ft. ___ Measured X Historical ___ Top of Well ___ Top of Protective Casing Well Riser Stick-up ___ Ft. (from ground) Protective Casing/Well Difference ___ Ft. FLUSH Protective Casing ___ Ft.

Depth to Water 10 Ft. Well Material: X PVC ___ SS Well Locked?: X Yes ___ No Well Dia. 1/2" ___ 2 inch ___ 4 inch ___ 6 inch Water Level Equip. Used: ___ Elect. Cond. Probe ___ Float Activated ___ Press. Transducer X NA

Height of Water Column 7 Ft. X ___ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = [1 Gal/Vol 6 Total Gal Purged]

Well Integrity: Yes No
Prot. Casing Secure ___ ___
Concrete Collar Intact ___ ___
Other ___ ___ ___

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None
X NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected ___ In-line X In Container
Sample Observations: ___ Turbid X Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 1 Gal.	@ 2 Gal.	@ 3 Gal.	@ 4 Gal.	@ 5 Gal.	6
Temperature, Deg. C	23.5	23	24	24	24	23
pH, units	6.27	6.26	6.24	6.35	6.26	6.24
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	147	149	149	151	149	148
Oxidation - Reduction, +/- mv						
~~Dissolved Oxygen, ppm~~ TURB	>200	>200	129	117	102	94

Sample Collection Requirements
(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

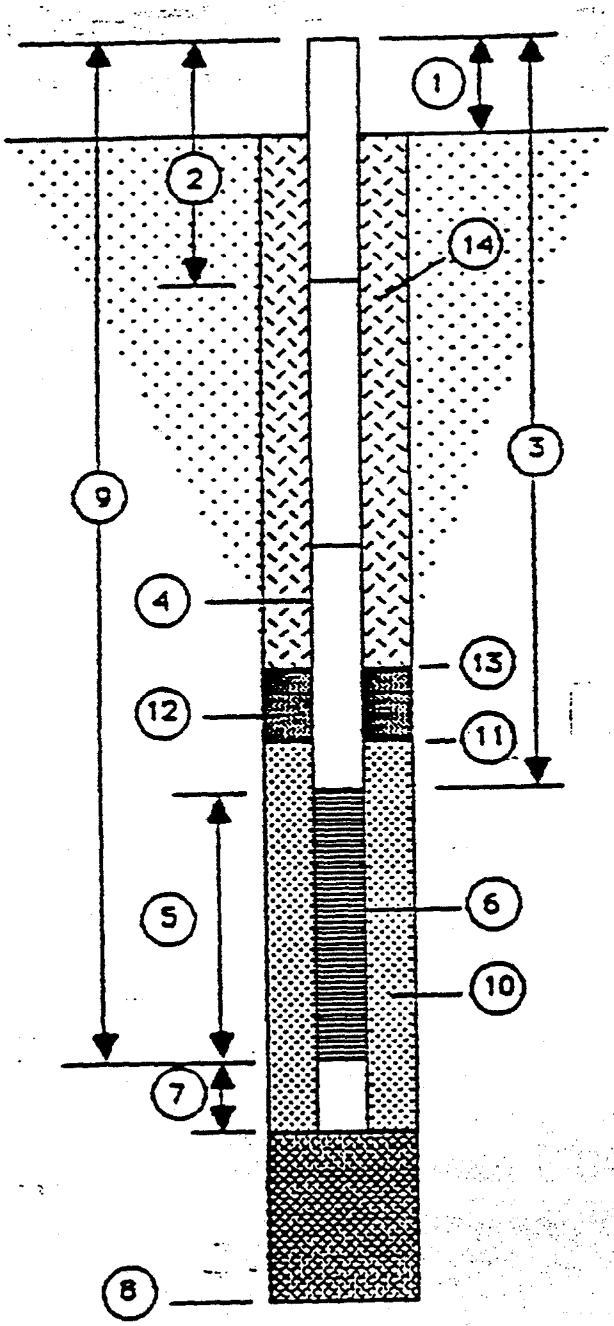
Notes: 3x 40 mL VIALS ; ANALYZED FOR EPA 524.2

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OD-39-15 X

DATE OF INSTALLATION 11/25/96



1. Height of Casing above ground FLUSH
2. Depth to first Coupling 2"
   Coupling interval Depths 2, 5, 8, 11, 14
3. Total Length of Blank Pipe 8'
4. Type of Blank Pipe 1/2" DIA PVC
5. Length of Screen 9'
6. Type of Screen 1/2" PVC, .01 SLOT
7. Length of Sump –
8. Total Depth of Boring 17' Hole Diameter 2"
9. Depth To Bottom of Screen 17'
10. Type of Screen Filter 20/40 SAND
    Quantity Used – Size – U/C –
11. Depth To Top of Filter 8'
12. Type of Seal BENTONITE
    Quantity Used 1 lb
13. Depth To Top of Seal 7'
14. Type of Grout CONCRETE
    Grout Mixture –
    Method of Placement POUR

COMMENTS ON INSTALLATION: WELL INSTALLED AS MICRO-WELL W/ GEOPROBE. EQUIPPED W/ LOCKING CAP, 8" MAN-HOLE AND COVER.

GROUNDWATER SAMPLE FIELD DATA

Project: SA 39 SUD SCREENING Point of Interest:
Project Number: 859.10 Date: 11/26/96
Sample Location ID: SA-39 / OCD-39-10
Time: Start: 1347 End: 1420 Signature of Sampler:

Water Level/Well Data

Well Depth 17 Ft. ___ Measured X Historical ___ Top of Well ___ Top of Protective Casing Well Riser Stick-up ___ Ft. (from ground) Protective Casing/Well Difference ___ Ft. FLUSH

Protective Casing ___ Ft.

Depth to Water 10 Ft. Well Material: X PVC ___ SS Well Locked?: X Yes ___ No Well Dia. 1/2" ___ 2 inch ___ 4 inch ___ 6 inch Water Level Equip. Used: ___ Elect. Cond. Probe ___ Float Activated ___ Press. Transducer X NA

Height of Water Column 7 Ft. X ___ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = [1 Gal/Vol; 4 Total Gal Purged]

Well Integrity:	Yes	No
Prot. Casing Secure		
Concrete Collar Intact		
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected ___ In-line X In Container

Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 1 Gal.	@ 2 Gal.	@ 3 Gal.	@ 4 Gal.	@ ___ Gal.
Temperature, Deg. C	23.5	24	24	24	
pH, units	5.71	5.84	5.62	5.57	
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	178	173	169	167	
Oxidation - Reduction, +/- mv					
~~Dissolved Oxygen, ppm~~ TURB	>200	>200	>200	>200	

Sample Collection Requirements (✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			
SVOA		4OC			
Pest/PCB		4OC			
Inorganics		HNO_3			
Explosives		4°C			
TPH		H_2SO_4			
TOC		H_2SO_4			
Nitrate		H_2SO_4			

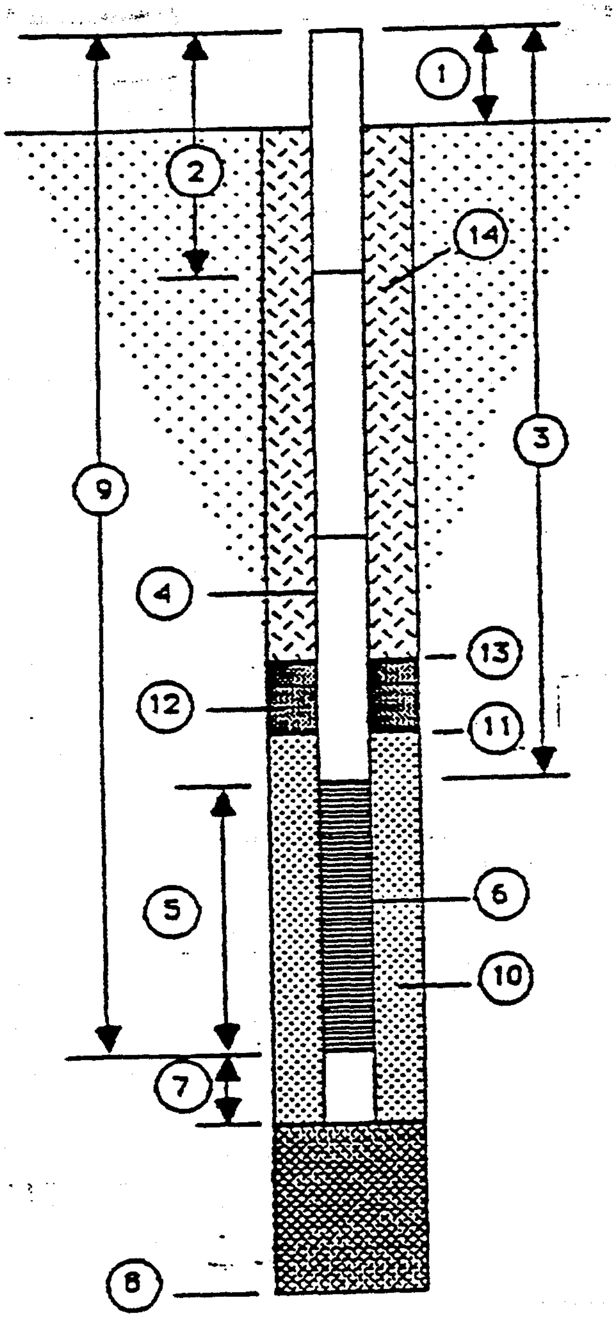
Notes: 3 X 40 MIL VIALS
ANALYZED FOR EPA 524.2

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OCD-39-10?

DATE OF INSTALLATION 11/25/91



1. Height of Casing above ground FLUSH
2. Depth to first Coupling 2"

   Coupling Interval Depths 2, 5, 8, 11, 14

3. Total Length of Blank Pipe 8'
4. Type of Blank Pipe 1/2" DIA PVC
5. Length of Screen 9'
6. Type of Screen 1/2 PVC, .01 SLOT
7. Length of Sump —
8. Total Depth of Boring 17' Hole Diameter 2"
9. Depth To Bottom of Screen 17
10. Type of Screen Filter 20/40 SAND

    Quantity Used — Size — U/C —

11. Depth To Top of Filter 8'
12. Type of Seal BENTONITE

    Quantity Used 1 lb

13. Depth To Top of Seal 7'
14. Type of Grout CONCRETE

    Grout Mixture

    Method of Placement POUR

COMMENTS ON INSTALLATION: WELL INSTALLED AS MICRO-WELL W/ TERRAPROBE. EQUIPPED W/ LOCKING CAP, 8" MAN-HOLE AND COVER.

GROUNDWATER SAMPLE FIELD DATA

Project: SA-39 SUP. SCREENING
Point of Interest: SA-39
Project Number: 8579-10
Date: 11/26/96
Sample Location ID: OLD-39-09
Time: Start: 1146 End: 1304
Signature of Sampler: ____

Water Level/Well Data

Well Depth 17' Ft. ___ Measured X Historical
___ Top of Well ___ Top of Protective Casing
Well Riser Stick-up ___ Ft. (from ground)
Protective ___ Ft. Casing/Well Difference FLUSH
Protective ___ Ft. Casing

Depth to Water 10' Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. 1/2' ___ 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: ___ Elect. Cond. Probe ___ Float Activated ___ Press. Transducer X NA

Height of Water Column 7 Ft. X ___ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = ≈1 Gal/Vol; 5 Total Gal Purged

Well Integrity: Prot. Casing Secure / Concrete Collar Intact / Other ___ — Yes ___ No ___

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling	Equipment	Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

Purge Data	@ 1 Gal.	@ 2 Gal.	@ 3 Gal.	@ 4 Gal.	@ 5 Gal.	6
Temperature, Deg. C	22	22.5	22	22.5	22	23
pH, units	6.53	6.35	6.63	6.84	6.81	6.83
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	420	410	395			
Oxidation - Reduction, +/- mv						
~~Dissolved Oxygen, ppm~~ TURB	7200	>200	7200	7200	7200	7200

Sample Collection Requirements

(✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4C			/ / /
Pest/PCB		4C			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

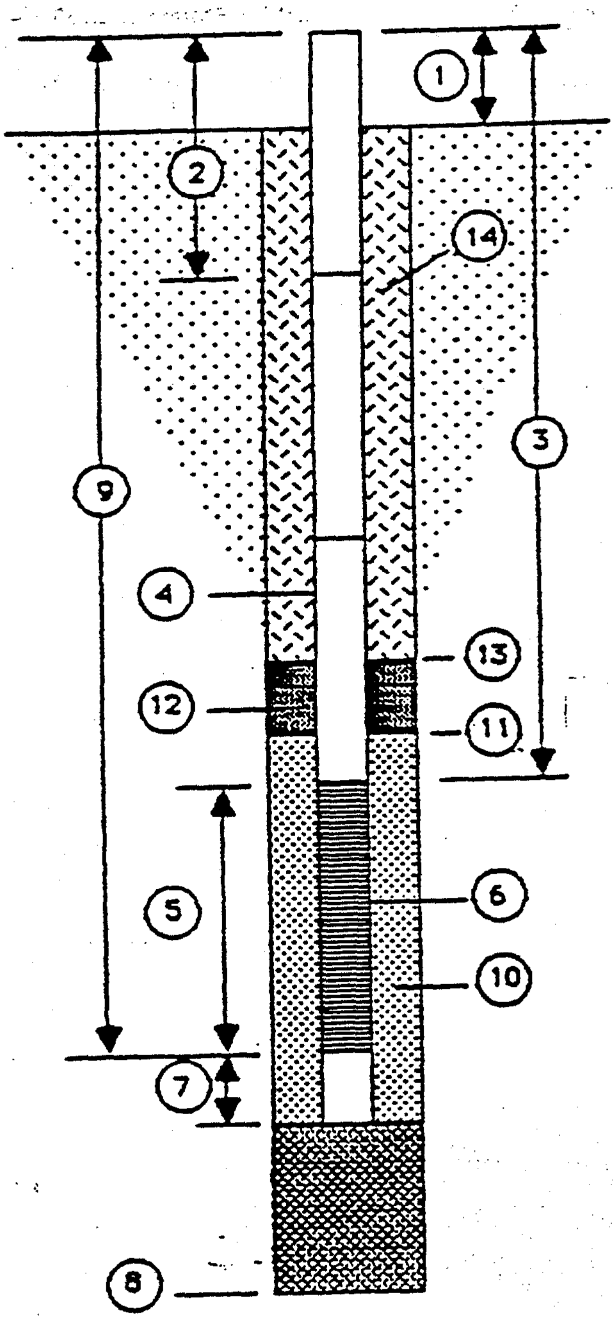
Notes: 3 x 40 ml VIALS; ANALYZED FOR EPA 524.2

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P. O. BOX 10068
CHARLESTON, S. C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-30-09 *

DATE OF INSTALLATION 11/25/96



1. Height of Casing above ground FLUSH
2. Depth to first Coupling 2'

   Coupling Interval Depths 2, 5, 8, 11, 14'

3. Total Length of Blank Pipe 8'
4. Type of Blank Pipe 1/2" DIA PVC
5. Length of Screen 9'
6. Type of Screen 1/2" PVC, .01 SLOT
7. Length of Sump –
8. Total Depth of Boring 17' Hole Diameter 2"
9. Depth To Bottom of Screen 17'
10. Type of Screen Filter 20/40 SAND

    Quantity Used – Size – U/C –

11. Depth To Top of Filter 8'
12. Type of Seal BENTONITE

    Quantity Used 1 lb

13. Depth To Top of Seal 7'
14. Type of Grout CONCRETE

    Grout Mixture

    Method of Placement POUR

COMMENTS ON INSTALLATION: * INSTALLED AS MICRO-WELL W/TERRAPROBE. EQUIPPED W/LOCKING CAP, 8" MAN-HOLE AND COVER.

GROUNDWATER SAMPLE FIELD DATA

Project: JA 39 SUPPLEMENTAL SCREEN Point of Interest: GLD-39-05
Project Number: 8579.10 Date: 11/26/96
Sample Location ID: JA 39
Time: Start: 1026 End: 1120 Signature of Sampler:

Water Level/Well Data

Well Depth 17 Ft. ___ Measured X Historical ___ Top of Well ___ Top of Protective Casing
Well Riser Stick-up ___ Ft. (from ground)
Protective Casing/Well Difference ___ Ft. FLUSH
Protective Casing ___ Ft.

Depth to Water ~10 Ft.
Well Material: X PVC ___ SS
Well Locked?: X Yes ___ No
Well Dia. 1/2" ___ 2 inch ___ 4 inch ___ 6 inch
Water Level Equip. Used: ___ Elect. Cond. Probe ___ Float Activated ___ Press. Transducer X ASA

Height of Water Column 7 Ft. X ___ .16 Gal/Ft. (2 in.) ___ .65 Gal/Ft. (4 in.) ___ 1.5 Gal/Ft. (6 in.) ___ Gal/Ft. (__ in.) = ~1 Gal/Vol; 5 Total Gal Purged

Well Integrity:	Yes	No
Prot. Casing Secure		
Concrete Collar Intact		
Other		

Equipment Documentation

Purging/Sampling Equipment Used:

(✓ If Used For)

Purging	Sampling		Equipment ID
	X	Peristaltic Pump	NA
		Submersible Pump	
		Bailer	
		PVC/Silicon Tubing	
		Teflon/Silicon Tubing	
		Airlift	
		Hand Pump	
		In-line Filter	
		Press/Vac Filter	

Decontamination Fluids Used:

(✓ All That Apply at Location)
___ Methanol (100%)
___ 25% Methanol/75% ASTM Type II water
___ Deionized Water
___ Liquinox Solution
___ Hexane
___ HNO_3/D.I. Water Solution
___ Potable Water
___ None

NEW TUBING

Field Analysis Data

Ambient Air VOC 0 ppm Well Mouth 0 ppm Field Data Collected ___ In-line X In Container
Sample Observations: X Turbid ___ Clear ___ Cloudy ___ Colored ___ Odor

1026 1035

Purge Data	@ 1 Gal.	@ 2 Gal.	@ 3 Gal.	@ 4 Gal.	@ 5 Gal.
Temperature, Deg. C	22	22	21.5	21.5	22
pH, units	5.8	6.09	6.42	6.41	6.44
Specific Conductivity (umhos/cm. @ 25 Deg. C.)	190	186	199	198	200
Oxidation - Reduction, +/- mv					
Dissolved Oxygen, ppm					
TURB	>200	>200	>200	185	166.4

Sample Collection Requirements (✓ If Required at this Location)

Analytical Parameter	✓ If Field Filtered	Preservation Method	Volume Required	✓ If Sample Collected	Sample Bottle IDs
VOA		HCL			/ / /
SVOA		4OC			/ / /
Pest/PCB		4OC			/ / /
Inorganics		HNO_3			/ / /
Explosives		4°C			/ / /
TPH		H_2SO_4			/ / /
TOC		H_2SO_4			/ / /
Nitrate		H_2SO_4			/ / /

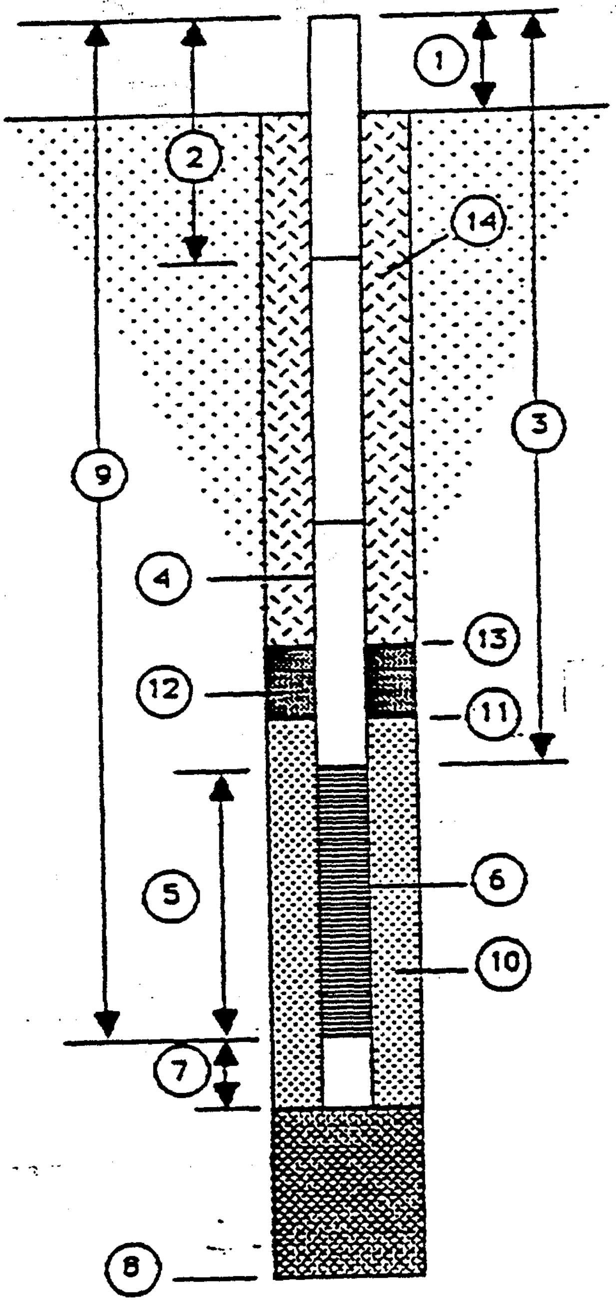
Notes: 3-40 MIL VIALS FOR 524.2 ANALYSIS

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON, S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-39-08 *

DATE OF INSTALLATION 11/25/96



1. Height of Casing above ground FLUSH
2. Depth to first Coupling 2'

   Coupling Interval Depths 2, 5, 8, 11, 14

3. Total Length of Blank Pipe 8'
4. Type of Blank Pipe 1/2" DIA PVC
5. Length of Screen 9'
6. Type of Screen 1/2" PVC, .01" SLOT
7. Length of Sump –
8. Total Depth of Boring 17 Hole Diameter 2"
9. Depth To Bottom of Screen 17'
10. Type of Screen Filter 20/40 SAND

    Quantity Used – Size – U/C –

11. Depth To Top of Filter 8'
12. Type of Seal BENTONITE

    Quantity Used 1 lb

13. Depth To Top of Seal 7'
14. Type of Grout CONCRETE

    Grout Mixture

    Method of Placement POUR

COMMENTS ON INSTALLATION: *WELL INSTALLED AS MICRO-WELL W/ TERRAPROBE- EQUIPPED W/ LOCKING CAP, 8" MAN-HOLE AND COVER.

APPENDIX B

TECHNICAL MEMORANDUM
GEOPHYSICAL SURVEY RESULTS
STUDY AREAS 39 AND 40

TECHNICAL MEMORANDUM

PROJECT: Study Areas 39 and 40
Naval Training Center, Orlando

SUBJECT: Geophysical Surveys

PREPARED BY: Richard Allen, Principal Scientist

DATE: May 10, 1996

1.0 INTRODUCTION

A geophysical survey was conducted at Study Areas (SAs) 39 and 40 in the southwest portions of the Main Base of the Naval Training Center, Orlando. The objective for the survey was to evaluate the nature and extent of potential landfilling activities that may have taken place in these areas. Also of concern are allegations of ordnance disposal in landfilled areas, prompting arrangements for an unexploded ordnance (UXO) survey prior to any intrusive activities.

Geophysical techniques employed during these surveys included magnetometry (MAG), time domain metal detector (TDMD), and ground penetrating radar (GPR). Figure 1 shows the area of the investigation and outlines the approximate boundaries of each of the geophysical techniques used in the survey.

The field program was conducted between January 15 and January 26, 1996.

1.1 PERSONNEL. Harding Lawson Associates (HLA) personnel involved in the field program include William Olson, Geologist; Marc Hawes, Associate Geologist; Robert Burns, Associate Engineer; and John Nash, Geologist. Greg Mudd was the Field Operations Lead during the investigation. Overall direction for the field program was provided by Richard Allen, Principal Scientist and Project Technical Lead.

1.2 FIELD PROGRAM.

1.2.1 Survey Grid Prior to the start of the field program, HLA established an arbitrary grid coordinate system in SAs 39 and 40. The grid coordinate system was oriented along magnetic north and consisted of a 100- by 100-foot grid established over the two adjoining survey areas with a cloth measuring tape and transit.

1.2.2 Magnetometer Survey The instrumentation consisted of an EDA OmniPlus proton precession magnetometer with vertical gradient capability. The survey was conducted on a 20- by 20-foot measurement grid.

The magnetic method is a versatile geophysical technique used for evaluating shallow geologic structures and for locating buried manmade objects and buried debris by mapping local distortions in the earth's magnetic field produced by buried magnetic objects (steel and other magnetic materials). Vertical gradient measurements of the earth's magnetic field are often taken during environmental magnetic surveys, as they are more sensitive to the presence of near-surface metal objects than total field values alone.

A total of 2,508 magnetometer measurements were acquired during the investigation.

1.2.3 Time Domain Metal Detector Survey A TDMD survey was conducted over SAs 39 and 40 between January 20 and January 26, 1996. The survey consisted of a series of parallel north-south traverses separated by 10 feet. Data were acquired along each traverse at the rate of 1.60 readings per foot (1 reading every 19 centimeters). Approximately 90,000 lineal feet of coverage and more than 140,000 readings were acquired during the investigation. The instrumentation consisted of a Geonics EM-61 TDMD with Polycorder high-capacity data logger.

The EM-61 TDMD was designed to map buried conductive objects, such as metal tanks, drums, and utilities. The instrument incorporates an antenna system consisting of a transmitter and receiver. The transmitter produces a series of electromagnetic (EM) wavelets that pulse into the earth 75 times per second. After each pulse, a secondary EM field is produced briefly from moderately conductive shallow soils and for a longer period of time from buried metallic objects. Between primary EM pulses, a time delay is imposed upon the data logger to permit the secondary response from the soils to dissipate prior to the somewhat later and longer response from any buried metal that is present. The receiver senses the secondary responses from metallic objects, and they are recorded by the data logger.

1.2.4 Ground Penetrating Radar Survey A GPR survey was conducted at SAs 39 and 40 between February 2 and February 9, 1996. The purpose for this work was to evaluate MAG/TDMD anomalies that were mapped during those investigations. The instrumentation consisted of a GSSI SIR 3 radar system equipped with a 500 MHz antenna.

The GPR technique uses high frequency radio waves to determine the presence of subsurface objects and structures. The radio wave energy is reflected from surfaces where there is a contrast in the electrical properties of subsurface materials, such as naturally occurring geologic horizons or manmade objects (e.g., buried utilities, tanks, and drums). Typical applications for GPR include mapping buried utilities and delineating the boundaries of buried hazardous waste materials and abandoned landfills.

1.3 RESULTS.

1.3.1 Survey Grid The arbitrary survey grid for SAs 39 and 40 established by HLA with a cloth tape and level is shown on Figure 1. The origin of the survey grid was located in the southwestern corner of SA 39 at a point designated as (X=1000 feet east, Y=1000 feet north).

1.3.2 Magnetometer Survey Figure 2 presents the locations for all MAG measurements taken in SAs 39 and 40. They were taken in the two study areas every 20 feet (20- by 20-foot measurement grid). The results of the magnetometer survey are presented as vertical gradient contours on Figure 3. The contour interval for Figure 3 is 10 gammas per meter.

Vertical gradient measurements are very useful in mapping the lateral extent of landfilled materials, since nearly all landfills contain sufficient ferrous materials to be mapped with this technique. As anticipated during the site walkover prior to the start of the geophysical survey, the survey area contains some cultural features that have produced significant distortion in the magnetic data. Such features include buried utilities, light poles, vehicles, fencing, buildings, and overhead power lines. Accordingly, only those portions of the study area sufficiently far removed from these surface and buried sources of magnetic interference can be used to assess the presence or absence of landfilled materials and potential contaminant sources. Magnetic disturbances from cultural features rendered some of the data collected during this investigation unusable for evaluation.

Figure 3 indicates that there are many areas with anomalous magnetic disturbances, but some of these areas can be explained by cultural features observed at the surface (Figure 4). There were 17 magnetic disturbances that could not be explained by correlation with surface features. These disturbances were chosen for further investigation with GPR, below.

<u>1.3.3 Time Domain Metal Detector Survey</u> The individual traverse locations for the TDMD survey for SAs 39 and 40 are presented on Figure 5. The TDMD vertical gradient contours are presented on Figure 6.

There is an upper and a lower coil (Channel [1] and Channel [2], respectively, on the data output) on the EM-61 TDMD. The lower coil is more sensitive to shallow buried objects. The vertical gradient contours presented on Figure 6 represent difference in the response between the upper and lower coils and is a dimensionless parameter. The gradient values minimize the effects of near surface metallic materials. Thus, theoretically, a contour map of the lower coil (Channel [2]) would map shallow metallic objects, whereas the vertical gradient contours would tend to emphasize the presence of relatively deeper metallic objects.

The most prominent feature on the vertical gradient contours is a southwest to northeast lineament starting at the southwest corner of SA 39. The feature is coincident with an 8-inch cast iron water main.

The "bottle landfill" (UNF-6) is also an area of anomalous TDMD contours, although the boundary of the disturbed area appears to extend approximately 75 feet north of the boundary that is shown. The southeast portion of SA 39 is quite disturbed, due to numerous cultural features in the area (Figure 4).

<u>1.3.4 Ground Penetrating Radar Survey</u> Figure 7 shows the locations of the GPR traverses that were completed in SAs 39 and 40. All GPR traverse locations were selected based on the results of the magnetometer survey. As previously discussed, there were approximately 17 magnetic anomalies that could not be explained by correlation with surface features. These disturbances were chosen for further investigation with GPR. Table B-1 presents an annotated interpretation of the GPR anomalies used as the basis for an explosive ordnance disposal (EOD) survey conducted by the U.S. Navy's EOD, Mobile Unit Six, Detachment Mayport, Mayport, Florida.

Table B-1
Magnetic Anomalies, Study Areas 39 and 40

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

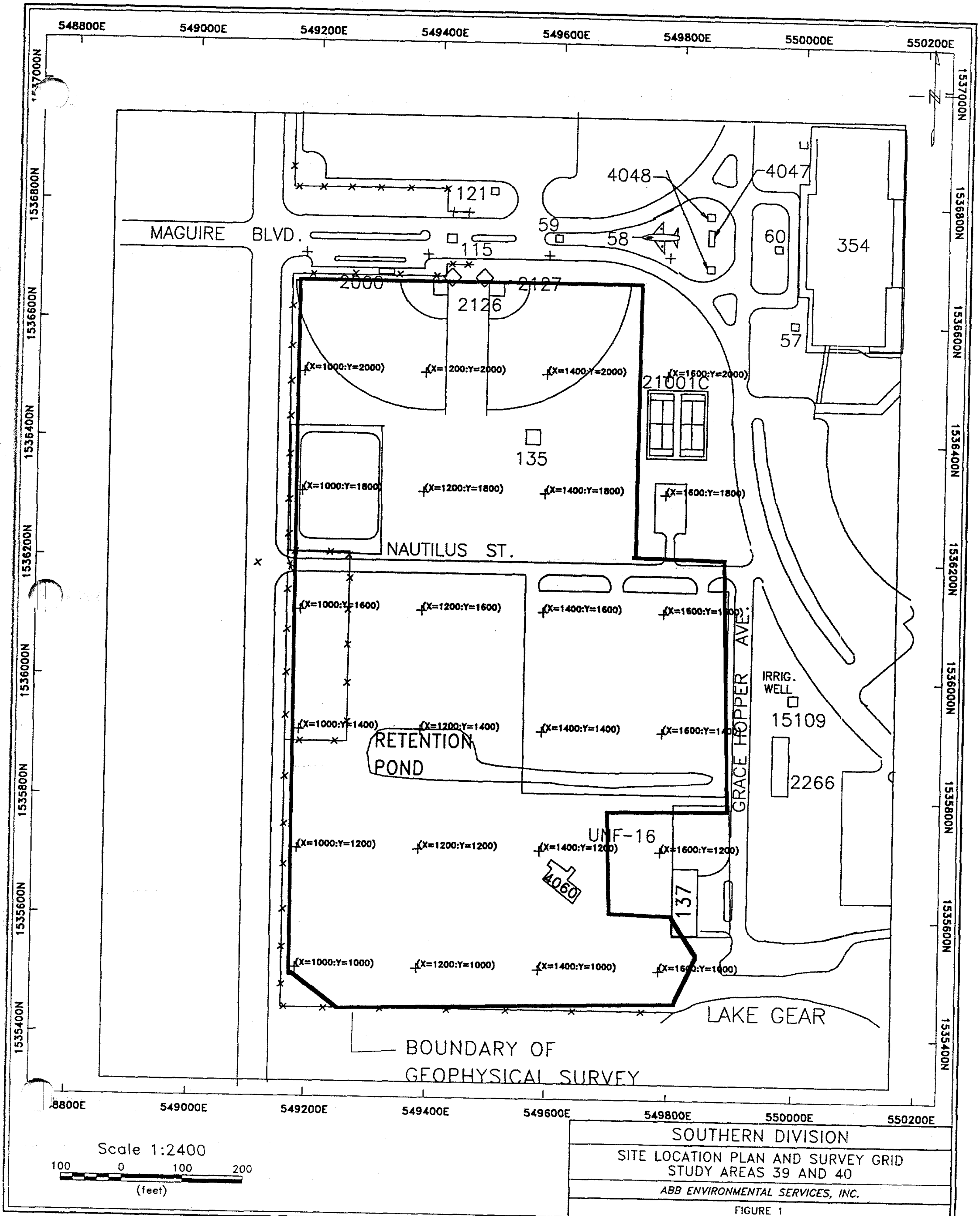
	East	North	Comments (Based on GPR Survey)
1	1180	1100	Water main or other major utility oriented SW/NE through middle of grid, 3.5 feet bls. Do not recommend dig.
2	1520	1280	At least 10 anomalies from less than 1 foot bls to nearly 3 feet bls. Anomaly locations: (1510E, 1270N, 2.5 feet bls), (1510E, 1280N, <1 foot bls), (1510E, 1300N and 1305N, 1 foot and 1.7 feet bls), (1520E, 1263N, 1.5 feet bls), (1520E, 1275N, 2.7 feet bls), (1520E, 1290N, 1.5 feet bls), (1530E, 1280N, 1 foot bls), (1535E and 1540E, 1270N, 1.5 feet and 1 foot bls).
3	1400	1360	No mappable GPR anomaly, data P-F.
4	1580	1360	GPR anomaly 1 foot bls, several feet across, does not look like metallic target, more geologic in nature.
5	1660	1440	Two small anomalies 1 foot bls at (1650E, 1450N) and (1660E, 1430N); series of 3 apparent utilities 3 feet to 5 feet bls at (1670E, 1430N to 1440N). Recommend dig two small anomalies.
6	1500	1480	One double anomaly at (1510E, 1475N to 1482N, 1.5 feet bls); another anomaly at (1490 to 1500E, 1465N), probably buried utility at 2.7 feet bls. Recommend dig first double anomaly.
7	1520	1520	Anomalies at (1515E and 1520E and 1530E, 1520N, 1.5 to 2.5 feet bls), and (1520E, 1530N, 2 feet bls). Recommend dig all.
8	1600	1520	Anomalies at (1590E, 1530N and 1537N, 4 feet and 2.2 feet bls), (1600E, 1530N, 4 feet bls), (1610E, 1514N, 4 feet bls), and (1610E, 1527 and 1530 and 1542N, 4 feet bls). Probable utilities. Do not recommend dig.
9	1180	1680	No GPR targets due to asphalt.
10	1440	1680*	
11	1540	1720	Many anomalies here. Probable utilities for some of the deeper ones (>2.0 feet bls). Anomaly locations: (1530E, 1710N, 1 foot bls), (1530E, 1715N, 1 foot bls), (1530E, 1726N, 2 feet bls), (1540E, 1714N, 1.6 feet bls), (1540E, 1717N, 1 foot bls), (1550E, 1718N, 1.7 feet bls), (1550E, 1728N, 1.6 feet bls), (1550E, 1732N, 1 foot bls), (1524E, 1710N, 1 foot bls), (1532E, 1710N, 1 foot bls), (1540E, 1710N, 2 feet bls), (1556E, 1710N, 2 feet bls), (1536E, 1720N, 1 foot bls), (1538E, 1720N, 1 foot bls), (1545E, 1720N, 1.6 feet bls), (1543E, 1720N, 1.5 feet bls), (1530E, 1730N, 2 feet bls), (1534E, 1730N, 1 foot bls), (1537E, 1730N, 1 foot bls), (1543E, 1730N, 2.7 feet bls), (1552E, 1730N, 2.7 feet bls). Recommend confirm.
12	1180	1780	No GPR targets.
13	1340	1800	Anomalies at (1330E, 1784N, 1 foot bls), (1330E, 1802N, 1.2 feet bls), (1342E, 1810N, 1 foot bls). Recommend confirm.
14	1180	1820	Two minor anomalies at (1170E, 1810N and 1834N, less than 1 foot bls). Possible buried cable? Recommend confirm.
15	1060	1840	Anomalies at (1048E, 1830N, 1 foot bls), (1058E, 1830N, 2 feet bls), (1050E, 1823N, 1 foot bls), (1060E, 1837N, 1.5 feet bls). Recommend confirm.
16	1180	1870	Minor anomaly at (1165E, 1860N, less than 1 foot bls). Possible buried cable? Recommend confirm.
17	1040	1950	One anomaly at (1034E, 1940N, 1 foot bls). Recommend confirm.

Notes: bls = below land surface.
GPR = ground-penetrating radar.
* probable car?

1.4 CONCLUSIONS. As anticipated, interference from cultural objects limited the effectiveness of the MAG and TDMD data in assessing subsurface conditions in some portions of SAs 39 and 40.

The geophysical data were useful in confirming the approximate outline of UNF-6 (the "bottle" landfill) and were essential in providing direction for the Navy's Mayport EOD team in their UXO investigation.

FIGURES FOR GEOPHYSICAL TECH MEMO

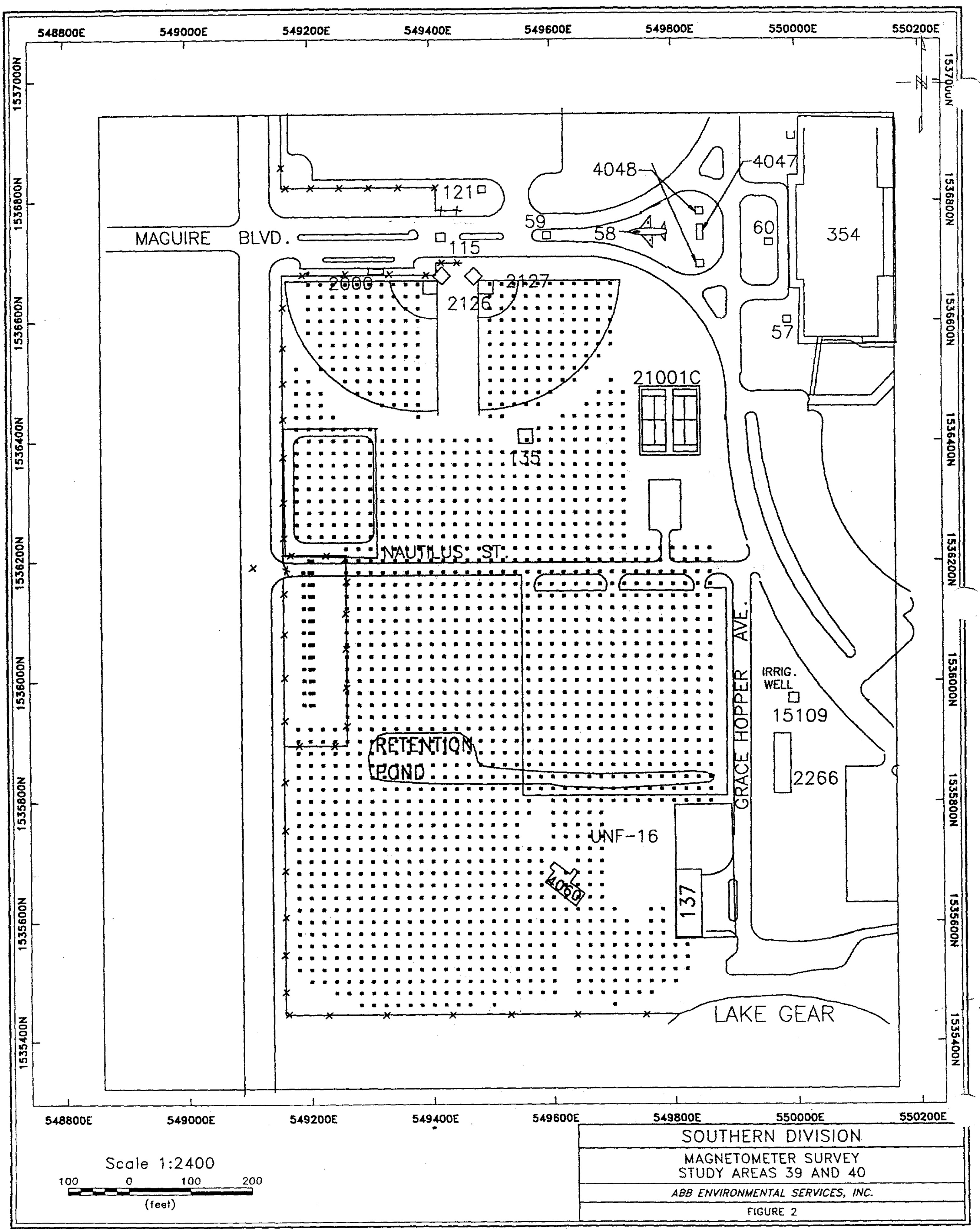


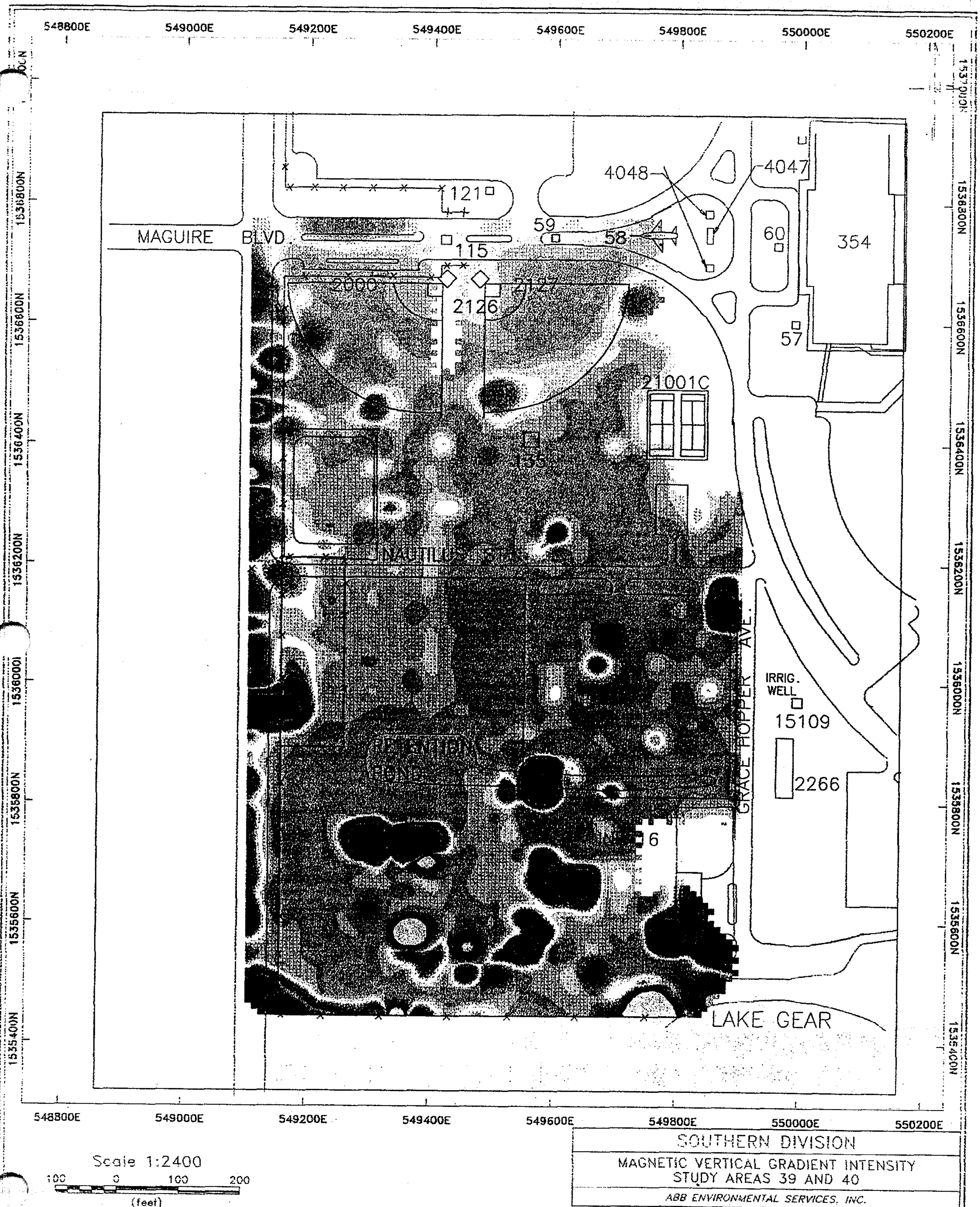
SOUTHERN DIVISION

SITE LOCATION PLAN AND SURVEY GRID
STUDY AREAS 39 AND 40

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 1


548800E
549000E
549200E
549400E
549600E
549800E
550000E
550200E
1537000N
1536800N
1536600N
1536400N
1536200N
1536000N
1535800N
1535600N
1535400N
MAGUIRE BLVD.
NAUTILUS ST.
GRACE HOPPER AVE.
LAKE GEAR
RETENTION POND
IRRIG. WELL
UNF-16
121
115
2000
2126
2127
59
58
4048
4047
60
354
57
21001C
135
15109
2266
137
4060
Scale 1:2400
100
0
100
200
(feet)
SOUTHERN DIVISION
MAGNETOMETER SURVEY
STUDY AREAS 39 AND 40
ABB ENVIRONMENTAL SERVICES, INC.
FIGURE 2

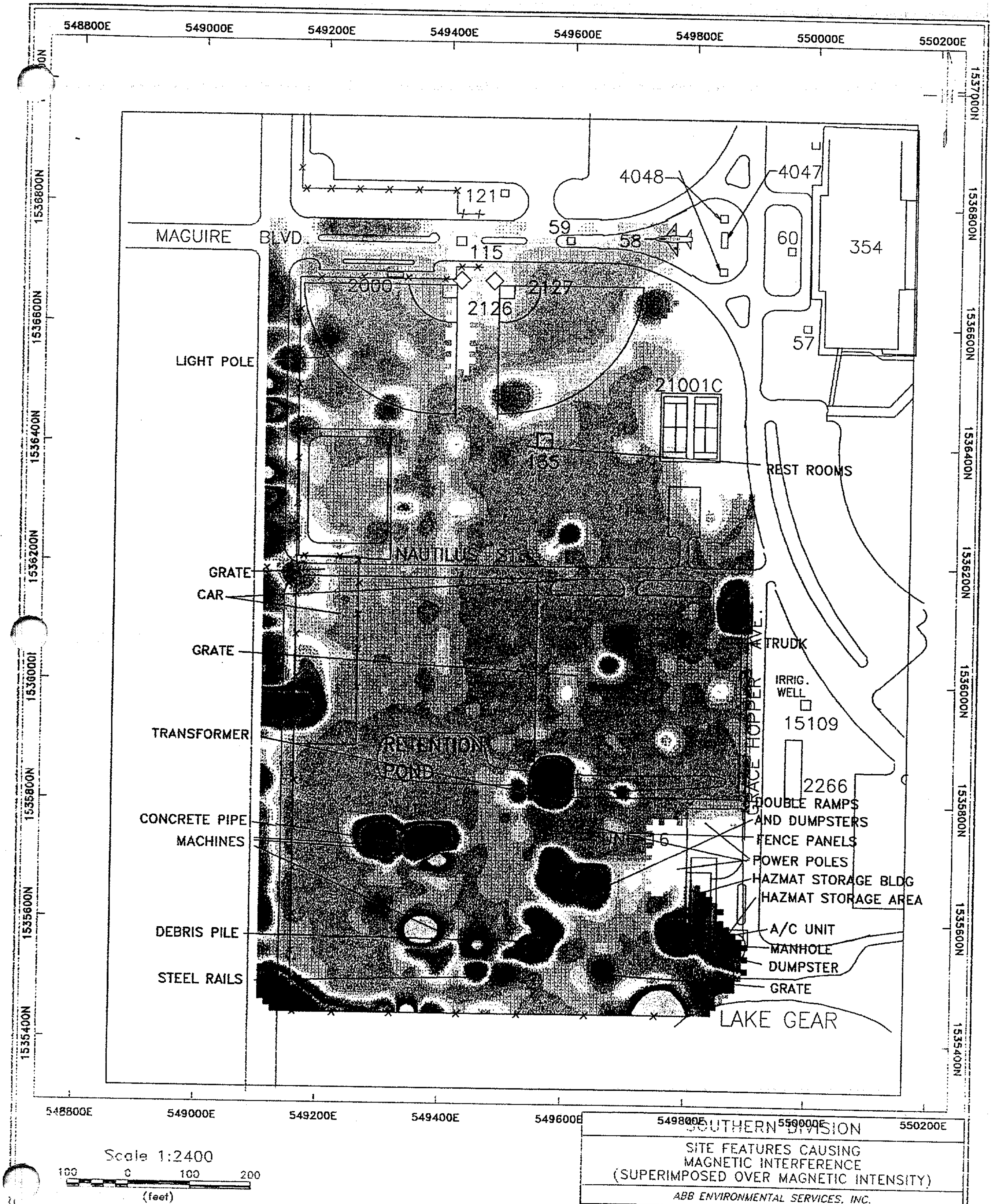


SOUTHERN DIVISION

MAGNETIC VERTICAL GRADIENT INTENSITY
STUDY AREAS 39 AND 40

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 3

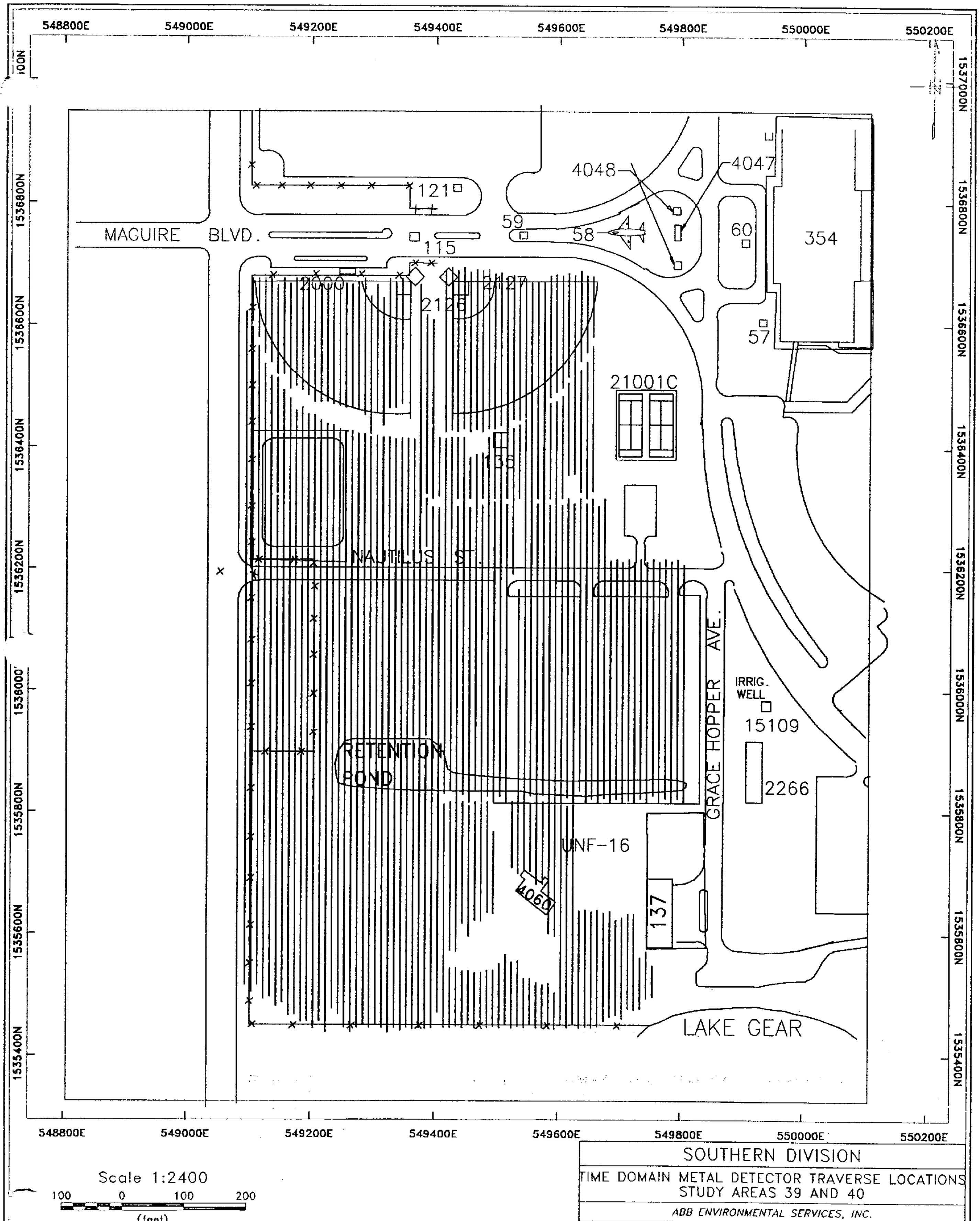


SOUTHERN DIVISION

SITE FEATURES CAUSING MAGNETIC INTERFERENCE (SUPERIMPOSED OVER MAGNETIC INTENSITY)

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 4

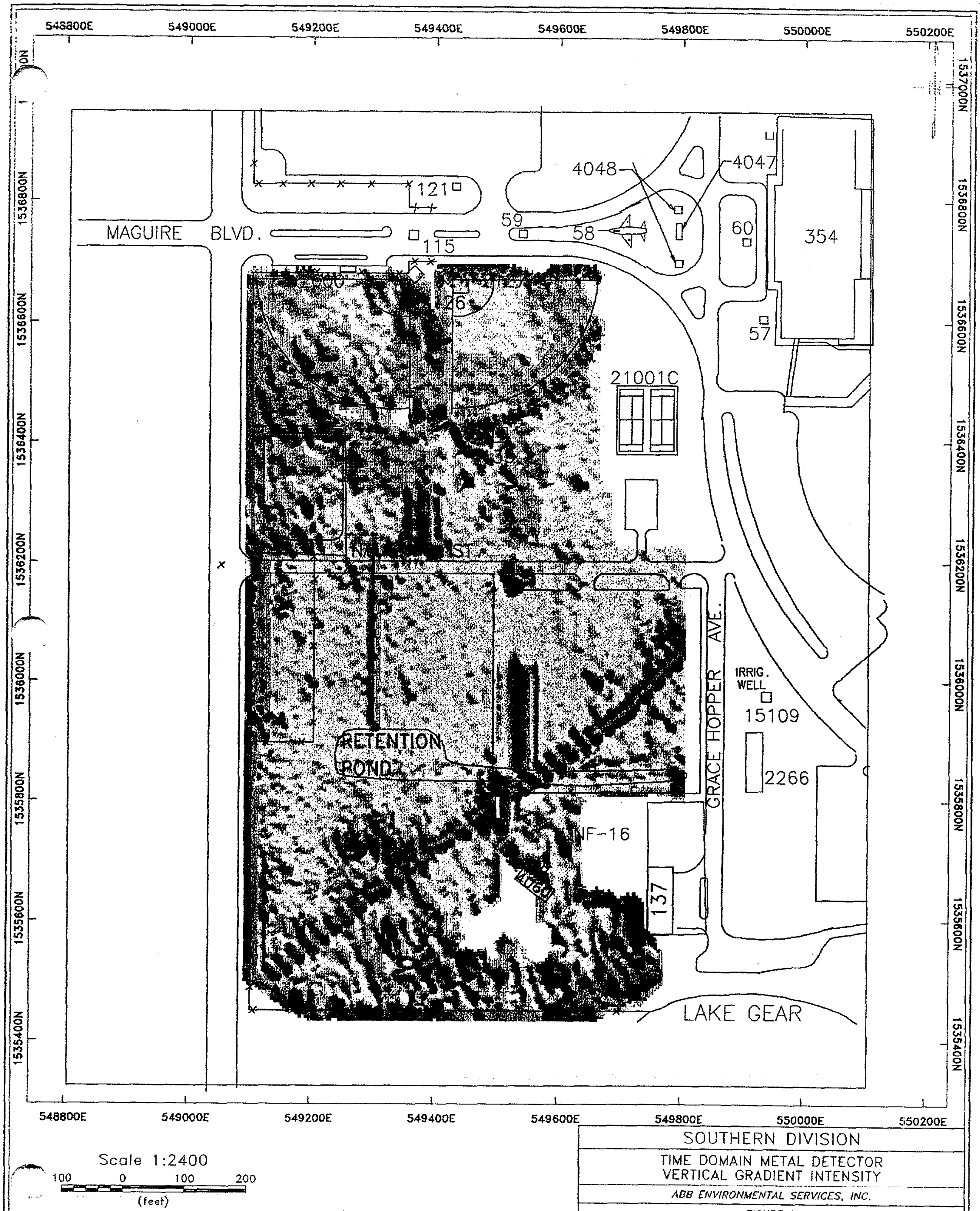


SOUTHERN DIVISION

TIME DOMAIN METAL DETECTOR TRAVERSE LOCATIONS
STUDY AREAS 39 AND 40

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 5

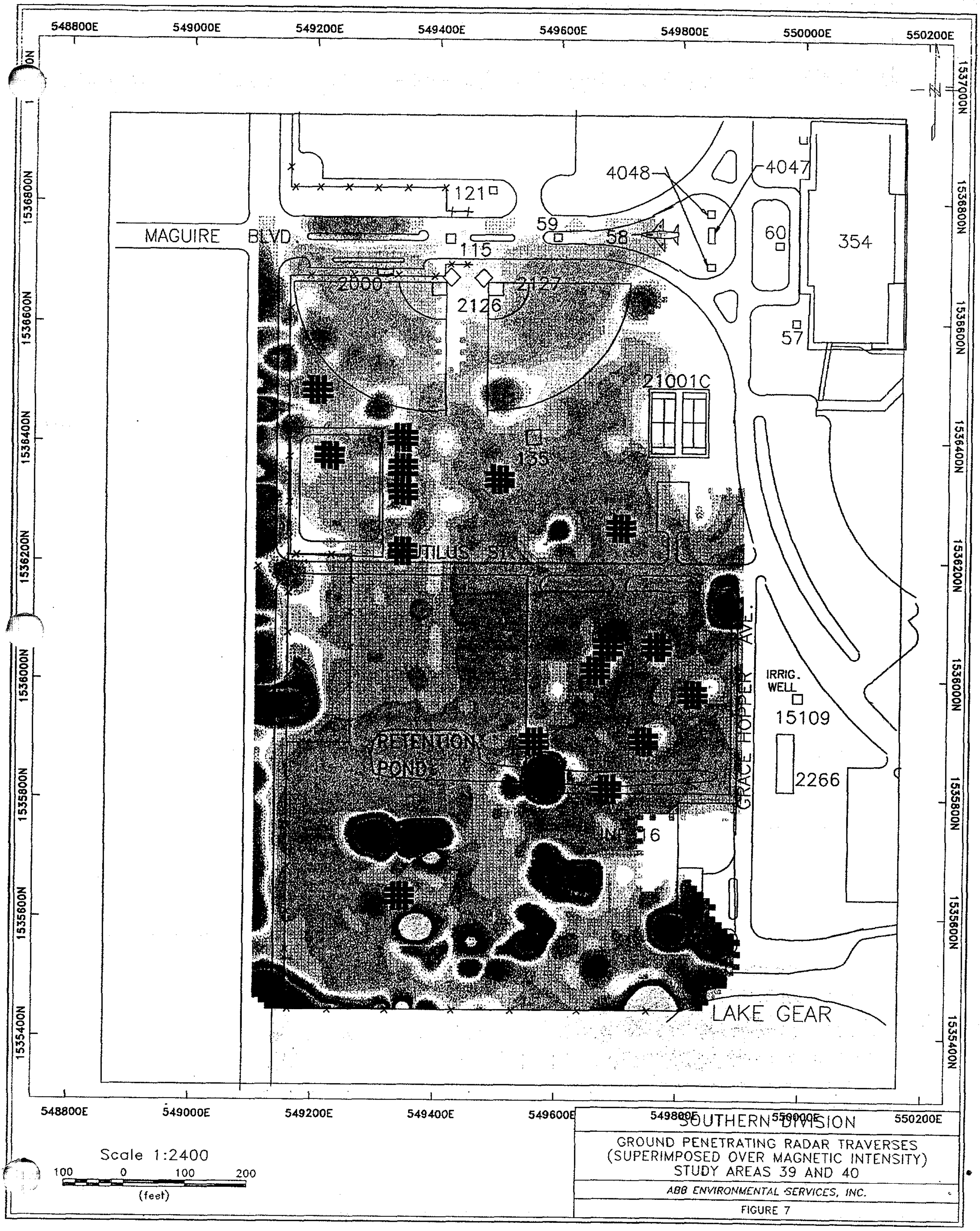


SOUTHERN DIVISION

TIME DOMAIN METAL DETECTOR
VERTICAL GRADIENT INTENSITY

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 6



SOUTHERN DIVISION

GROUND PENETRATING RADAR TRAVERSES (SUPERIMPOSED OVER MAGNETIC INTENSITY) STUDY AREAS 39 AND 40

ABB ENVIRONMENTAL SERVICES, INC.

FIGURE 7

APPENDIX C

UXO SURVEY RESULTS

DEPARTMENT OF THE NAVY
EXPLOSIVE ORDNANCE DISPOSAL MOBILE UNIT SIX
DETACHMENT MAYPORT
MAYPORT, FLORIDA 32228-0023

8027
Ser 008
15 Feb 1996

From: Officer in Charge, Explosive Ordnance Disposal Mobile Unit SIX Detachment Mayport
To: Commander, Naval Training Center Orlando

Subj: RESULTS OF EOD ANOMALY SURVEY ISO NTC ORLANDO BRAC 5-16 FEB 1996

Encl: (1) Gas Well Test Site (adjacent to NTC Main Gate)
(2) McCoy Annex Fence Line Site
(3) McCoy Annex Pond Site

1. This detachment conducted magnetic anomaly surveys and intrusive operations at designated sites in support of NTC Orlando BRAC. Enclosures 1-3 contain specific results of excavation operations. Magnetic anomalies were initially identified by civilian contractor. Anomalies were surface marked prior to USN EOD arrival. Surface marks were found to be within plus/minus 20 feet of original survey. The marks at McCoy Annex Fence Line Site 1A (enclosure 2) were deemed unreliable by EOD and a magnetic anomaly survey was conducted of the entire area. No ordnance or ordnance like objects were detected at any of the sites (enclosures 1-3).

2. Metallic contacts were reacquired or detected using the Mk 26 Ferrous Metal Detector and MK 29 All-Metals Detector. All anomalies detected to an approximate depth of 3-4 feet were investigated. Previous testing by civilian contractor using ground penetrating radar (GPR) had identified some anomalies to depths down to 8 feet.

3. As stated, I found NO indications of buried unexploded ordnance (UXO). "Indications" would include fragmented metal, UXO components such as fuzes, fins, containers, spent shell casings, aircraft suspension components, etc. As a result of these findings I do not recommend further investigation of the anomalies that were deeper than 3-4 feet. There is NO physical evidence that any ordnance was buried or discarded at any of the sites surveyed.

4. Point of contact is myself, CWO4 Thornton, Comm: (904)270-5412, DSN: 960-5412, FAX (904) 270-6880.

R. D. THORNTON

Copy to:
Base Transition Officer

RESULTS FOR ANOMALY INVESTIGATION
GAS WELL TEST SITE

1. This area, adjacent to the main gate and softball field, consisted of 430 gas test well sites and 30 magnetic anomalies. The test wells were designated by surface survey flags placed by ABB (civilian contractor). The anomalies were previously located by contractor, surface marked by contractor, and EOD was tasked with identification of anomaly.

2. All designated site were checked and anomalies unearthed, as required. NO ordnance related items were located. The majority of site was apparently an old dump area that had been covered over with dirt. Furthermore, no gases or odors were humanly detected at the excavation sites.

3. Several anomalies were not excavated due to the being detected under the adjacent parking lot. As a result of NO evidence of ordnance at throughout the survey of this area I do NOT recommend tearing up the parking lot and pursuing the excavation of the remaining anomalies.

RESULTS FOR ANOMALY INVESTIGATION
McCOY ANNEX FENCE LINE

GRID NO.	ITEMS FOUND
4A-001	TWO TIN CANS, SMALL PIPE, SURVEYOR FLAG WIRE
4A-002	SIX INCH WHEEL AND BRACKET
4A-003	SURVEYOR FLAG WIRE
4A-004	LARGE COTTER PIN
4A-005	NOTHING FOUND
4A-006	SURVEYOR FLAG WIRE AND ALUMINUM CAN
4A-007	ONE INCH BED SPRING
4A-008	NOTHING FOUND
4A-009	ONE INCH BED SPRING
4A-010	NOTHING FOUND
4A-011	ALUMINUM CAN
4A-012	NOTHING FOUND
4A-013	ONE INCH STEEL NUT
4A-014	NOTHING FOUND
4A-015	SURVEYOR FLAG WIRE
4A-016	ALUMINUM CAN
3A-017 thru 019	SURVEYOR FLAG WIRE
3A-020	SURVEYOR FLAG WIRE AND 3 INCH PIN BY ½ INCH DIAMETER
3A-021	NOTHING FOUND
3A-022	SIX INCH BY ½ INCH METAL ROD
3A-023	NOTHING FOUND
3A-024	SURVEYOR FLAG WIRE
3A-025 thru 026	NOTHING FOUND
3A-027	TWO ALUMINUM CANS
3A-028	NOTHING FOUND
3A-029	TWO SURVEYOR FLAG WIRES AND CHUNK OF METAL
3A-030	NOTHING FOUND
3A-031	TEN INCH METAL HANDLE AND ALUMINUM CAN
3A-032 thru 035	NOTHING FOUND
3A-036	ALUMINUM CAN
3A-037	THREE BINDER FRAME AND SIX INCH PIECE OF WIRE
2A-038	SURVEYOR FLAG WIRE AND ONE INCH WIRE
2A-039	THREE ALUMINUM CANS
2A-040	STEEL CAN
2A-041	NOTHING FOUND
2A-042	SIX INCH BY ½ INCH STEEL BAR
2A-043	NOTHING FOUND
2A-044	THREE INCH STEEL (RUSTED) SCRAP

2A-045	FOURTEEN INCH BY ONE INCH STEEL BAR
2A-046	TWO INCH METAL DISC
2A-047	SIX INCH BY EIGHT INCH METAL PLATE AND ALUMINUM CAN
2A-048	TWO INCH STEEL BOLT AND TWO INCH STEEL SCRAP
2A-049	TWO INCH SCRAP OF STEEL AND ALUMINUM CAN
2A-050	TOP FROM ALUMINUM CAN
2A-051	STEEL CAN OPENER
2A-052	SMALL PIECES OF SCRAP METAL
2A-053	FOUR INCH BY TWO INCH SCRAP METAL
2A-054	ONE INCH BY TWO INCH SCRAP METAL
2A-055	ALUMINUM CAN
2A-056	STEEL SHOCK ABSORBER
2A-057	SIX PIECES OF ALUMINUM FOIL
2A-058	SURVEYOR FLAG WIRE AND PIPE FITTING
2A-059	BICYCLE SEAT AND ALUMINUM CAN
2A-060	TIN CAN AND METAL TAG
2A-061	LINOLEUM KNIFE
2A-062	NOTHING FOUND
2A-063	ALUMINUM CAN AND TIN CAN
2A-064	SPARKPLUG AND LID TO METAL CAN
2A-065	SURVEYOR FLAG WIRE
2A-066	FLASHLIGHT AND SPARKPLUG
2A-067	TOP TO ALUMINUM CAN
2A-068	FOUR INCH STEEL WIRE
1A-069	ONE INCH BANDING MATERIAL
1A-070	STEEL SCREW
1A-071	STEEL WASHER
1A-072 thru 082	NOTHING FOUND
1A-083	CHUNK OF STEEL AND A NAIL
1A-084 thru 091	NOTHING FOUND
1A-092	TWO EACH RAIL ROAD SPIKES
1A-093 thru 094	NOTHING FOUND
1A-095	ALUMINUM FOIL
1A-096 thru 098	NOTHING FOUND
1A-099	LARGE NAIL SPIKE WITH SURVEYOR TAPE ATTACHED
1A-100 thru 104	NOTHING FOUND
1A-105	SIX INCH BY TWO INCH STEEL BAR
1A-106 thru 110	NOTHING FOUND

RESULTS OF ANOMALY INVESTIGATION
McCOY ANNEX POND SITE

ID NO.	ITEMS FOUND
PS-001	THREE STEEL WASHER
PS-002 thru 004	NOTHING FOUND
PS-005	FIVE INCH BY ONE INCH STEEL BOLT
PS-006	CORRODED WELDING ROD
PS-007	NOTHING FOUND
PS-008	TWO INCH SQUARE BY HALF INCH THICK WASHER AND RAIL ROAD SPIKE
PS-009	NOTHING FOUND
PS-010	RAIL ROAD SPIKE
PS-011	DOOR HANDLE
PS-012 thru 014	NOTHING FOUND
PS-015	BOTTLE TOP
PS-016	TOP TO ALUMINUM CAN
PS-017	NOTHING FOUND
PS-018	ALUMINUM CAN
PS-019	NOTHING FOUND
PS-020	FOUR INCH NAIL
PS-021	THREE INCH HINGE AND WATER PIPE
PS-022	WET
PS-023	WET
PS-024	WET
PS-025	THREE INCH STEEL NAIL
PS-026	SIX INCH STEEL NAIL
PS-027	THREE INCH STEEL NAIL
PS-028	STEEL BOLT AND WATER PIPE THREE FEET DOWN
PS-029	NOTHING FOUND
PS-030	ALUMINUM CAN
PS-031 thru 033	SURVEYOR FLAG WIRE AT ALL LOCATIONS
PS-034	ALUMINUM CAN
PS-035	RAIL ROAD SPIKE
PS-036 thru 040	NOTHING FOUND
PS-041	NOTHING FOUND
PS-042	THREE INCH DIAMETER BY THREE INCH PIPE COUPLING
PS-043	ONE INCH CHUNK OF STEEL
PS-044	RAIL ROAD SPIKE AND LARGE STEEL NAIL
PS-045	TWO LARGE STEEL NAILS AND TWO SIX INCH BY THREE INCH RAIL ROAD HOLD DOWN PLATES

Encl 3

APPENDIX D

PASSIVE SOIL GAS SURVEY RESULTS

NERI
No[illegible]ast Research Institute LLC

605 Parfet Street • Suite 100
Lakewood, Colorado 80215-5518
303-238-0090 • 800-845-5137
Fax 303-238-2522

FINAL REPORT
ON THE FINDINGS OF
THE PETREX SOIL GAS SURVEYS
PERFORMED AT STUDY AREA 39
AND STUDY AREA 40
AT THE NAVAL TRAINING CENTER
IN ORLANDO, FLORIDA

PREPARED FOR:
ABB ENVIRONMENTAL SERVICES, INC.

PREPARED BY: DATE:

Julia Olney Gullett, Senior Geologist

APPROVED BY: DATE:

Paul A. Harrington, Operations Manager

NORTHEAST RESEARCH INSTITUTE
605 PARFET STREET, SUITE 100
LAKEWOOD, COLORADO 80215
(303) 238-0090

2465E

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

In February 1996, Northeast Research Institute LLC (NERI) and ABB Environmental Services, Inc. (ABB-ES) completed PETREX passive soil gas sampling at Study Areas 39 and 40 at the Naval Training Center in Orlando, Florida per P.O. SE627024G. According to ABB-ES, Study Area 39 was formerly used as a coal storage yard, an alleged drum storage area, and an alleged landfill. Study Area 40 is a former landfill reportedly used for the disposal of household wastes, and potentially petroleum wastes. The purpose of the PETREX surveys was to screen each landfill and determine the nature and areal extent of volatile and semivolatile organic compounds (VOCs and SVOCs) in the subsurface.

STUDY AREA 39

Tetrachloroethene (PCE) and petroleum hydrocarbon compounds related to a hydrocarbon mixture similar to gasoline were detected in Study Area 39. Occurrences of PCE, benzene, toluene, ethylbenzene/xylene(s) (BTEX) and Gasoline Range Organics (GRO) were reported and mapped. A potential source of PCE appears to have been identified northwest of the hazardous materials storage area and west of the ground maintenance building. PCE occurrences appear to be limited and were defined by this investigation. Potential source areas of BTEX and GRO include the vicinity of the hazardous materials storage area and areas located north and northeast of the former coal staging area. Migration of BTEX and GRO appears to trend east-west, and may indicate a preferential migration pathway created by an artificial conduit or a lithological changes. Occurrences of GRO and BTEX may extend beyond the limits of this investigation to the east, therefore the areal extent of petroleum hydrocarbons was not defined.

STUDY AREA 40

No VOCs or SVOCs indicative of widespread contamination in subsurface soils/groundwater were detected in Study Area 40.

2.0 INTRODUCTION

In February 1996, Northeast Research Institute LLC (NERI) and ABB Environmental Services. Inc. (ABB-ES) completed PETREX passive soil gas sampling at Study Areas 39 and 40 at the Naval Training Center in Orlando, Florida per P.O. SE627024G. According to ABB-ES. Study Area 39 was formerly used as a coal storage yard, an alleged drum storage area. and an alleged landfill. Study Area 40 is a former landfill reportedly used for the disposal of household wastes. and potentially petroleum wastes. The purpose of the PETREX surveys was to screen each landfill and determine the nature and areal extent of volatile and semivolatile organic compounds (VOCs and SVOCs) in the subsurface.

3.0 OBJECTIVES

The objectives of this soil gas survey were to:

1. Collect and report VOCs and SVOCs as constituents of the soil gas;

2. Map the distribution of the compound occurrences to aid in defining potential source areas, preferential migration pathways and the areal extent of chemical occurrences.

3. Provide data to aid in developing strategies for monitoring groundwater quality, and developing future investigative studies.

4.0 OVERVIEW OF THE PETREX TECHNIQUE

Each PETREX soil gas sampler consists of two or three activated charcoal adsorption elements (collectors) housed in a resealable glass container in an inert atmosphere.

Soil gas sample collection is performed by unsealing the sampler and exposing the collector to the soil gas of the subsurface environment at the base of a shallow borehole. Sample collection proceeds via free vapor diffusion through the opening of the uncapped sampler container. Following a controlled period of time, the sampler is retrieved from the borehole, resealed, and submitted for analysis.

One collector from each soil gas sampler is analyzed by Thermal Desorption/Mass Spectrometry (TD-MS). Selected second collectors may be analyzed by Thermal Desorption-Gas Chromatography/Mass Spectrometry (TD-GC/MS) for compound confirmation. At least ten percent of samplers used in any project are three collector samplers. The third collector is used for setting instrument sensitivity prior to analysis.

Compounds are identified by comparison to standard reference spectra run on the same instrument. The mass spectral ion count of the appropriate indicator peak(s) for each compound or group of compounds is then plotted as relative response on a map and contoured using a variety of standard geostatistical analyses.

For a more detailed and technical discussion of the method, please refer to Appendix A. PETREX Protocol.

5.0 SCOPE OF WORK

NERI provided ABB-ES with 386 PETREX samplers, plus travel blanks and time calibration samplers. NERI also supplied written instructions on PETREX field methods, field sampling tools, and telephone support to ABB-ES as they conducted the field tasks to complete the sampling. The PETREX samplers and equipment were shipped to ABB-ES on February 1, 1996. ABB-ES began installation of the PETREX samplers the week of February 12, 1996. Time calibration samplers were used as a guide to estimate an appropriate exposure time. Samplers were retrieved from the field and sent to NERI's Lakewood laboratory for TD-MS analysis. The analytical results were compiled onto compound distribution maps and this interpretive report.

6.0 FIELD ACTIVITIES

ABB-ES began installation of the PETREX samplers the week of February 12, 1996. Samplers were placed on a regular grid on fifty (50) foot intervals throughout the two adjacent Study Areas. All sampler locations are shown on Plate 1, Appendix F.

Sampler installation was performed by creating a narrow borehole, approximately 18" in depth below the surface, using a rotary hammer drill, and placing the opened sampler, inverted, at the bottom of the hole. The borehole was backfilled with an aluminum foil plug and capped with hydraulic cement with the sampler in place.

6.1 Sampler Exposure Time

PETREX soil gas samplers are retrieved following a time period that has allowed for the soil gas emanating from the subsurface environment of a survey area to equilibrate with the installed PETREX samplers. This time integration period is determined for each PETREX soil gas survey based on time calibration data or site conditions. Samplers reach equilibrium with soil gas during the exposure period so that there are minimal variances in response between samples. Samplers are retrieved in the same order in which they were installed to minimize any variations based upon sample exposure time.

ABB-ES personnel selected four locations for time calibration samplers. The first set of time calibration samplers was analyzed after a four day exposure and the second set of time calibration samplers was analyzed after a ten day exposure. The preliminary data from the time calibration samplers showed the presence of tetrachloroethene (PCE), methyl-tert-butyl-ether, and petroleum hydrocarbons. Thus, after an exposure of sixteen days, ABB-ES returned to Study Areas 39 and 40 to retrieve all the samplers. The samplers were received at NERI's laboratory on March 4, 1996 and were analyzed by TD-MS on March 6-8, 1996. All Chain of Custody Documents received by NERI are included in Appendix E.

7.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

7.1 Lot Control

Quality assurance/quality control (QA/QC) collectors from each lot manufactured by NERI were analyzed by TD-MS to ensure that they were contaminant free before the lot of collectors used in the field was released from the PETREX laboratory. No compounds were detected above background on the QA/QC collectors.

7.2 Travel Blanks

One PETREX sampler was randomly selected as a travel blank from each bag of survey samplers. These travel blanks remained sealed and traveled with the survey samplers from the laboratory to the field and back to the laboratory to monitor potential contamination of the survey samplers. The travel blank samples were given the numeric designations 900 - 912 and were analyzed under the same instrument conditions as the survey collectors. Results of TD-MS analyses of the travel blanks for the targeted compounds are provided in Table B1, Appendix B.

7.3 DUPLICATE SAMPLES

Ten percent (10%) of the PETREX collectors were used as duplicate samples. The purpose of the duplicate samples was to monitor the reproducibility of the PETREX collector. Results of the replicate analyses are discussed in Section 8.2 of this report.

A more detailed description of the PETREX QA/QC may be found in the PETREX Protocol located in Appendix A.

8.0 RESULTS

8.1 TD-MS RESULTS

All samplers were analyzed by NERI's standard method of Thermal Desorption/Mass Spectrometry (TD-MS). Tetrachloroethene (PCE) and petroleum hydrocarbon compounds related to a hydrocarbon mixture similar in composition were the most prominent compounds detected in soil gas. In addition to the compounds mentioned above, a single sample exhibiting the occurrence of chloroform was identified, and a single sample exhibiting the occurrences of polycyclic aromatic hydrocarbons (PAHs) such as anthracene, was identified. The identification of anthracene as well as other PAHs are only tentative at this time, and can not be confirmed without TD-GC/MS analysis.

Occurrences of PCE, BTEX and Gasoline Range Organics (GRO) have been reported and mapped. In order to map the reported compounds, mass spectral peaks indicative of the compounds were selected and their corresponding ion counts were summed and plotted. Table 2 lists the reported compounds and their selected indicator mass peaks.

TABLE 2
Reported Compounds and Their Indicator Mass Peaks

Reported Compound	Indicator Mass Peak(s) (AMU)
PCE	164
BTEX	78, 92, 106
Gasoline Range Organics (excluding BTEX)	
Sum of the C4-C9 cylcloalkanes/alkenes	56, 70, 84, 98, 112, 126

Sample mass spectra of the compounds identified are shown as Figures C1-C4, Appendix C. A mass spectrum of a representative travel blank sample is shown as Figure C5.

The distributions of the compound occurrences have been mapped and are shown on the following plates:

Plate 1: Sample Location Map
Plate 2: Relative Response of Tetrachloroethene (PCE)
Plate 3: Relative Response of Benzene, Toluene, Ethylbenzene/Xylene(s)
Plate 4: Relative Response of Gasoline Range Organics

Plates 1 through 4 are provided in Appendix F.

8.2 Duplicate Samples

The second collector wire from ten percent (10%) or twenty six (26) of the survey samples were analyzed for the purpose of yielding a duplicate QA/QC sample result. The duplicate samples were analyzed by TD-MS analysis during the survey sample analysis. The results of the duplicate sample analysis indicate that identical compounds were detected in sample duplicates. The relative percent difference in the magnitude of response for the detection of PCE varied by an average of 4.2%; the relative percent difference in the magnitude of response for the detection of BTEX varied by an average of 30.6%; the relative percent difference in the magnitude of response for GRO varied by an average of 26.2 %.

Replication of the PETREX response values generally fall within a range of 20% variability in samples exhibiting high response. Samples exhibiting levels below the detection limit (ND), essentially show 100% reproducibility. In samples exhibiting intermediate response values, reproducibility becomes more variable and, as with any dataset, occasional outliers exist (i.e. samples 124 and 182). Reproducibility is not only influenced by the levels of compounds detected, but is also significantly influenced by the number of compounds summed to report a mixture. The highest variability is generally observed in the reporting of mixtures such as BTEX and GRO. When the individual constituents of these mixtures are evaluated, the variation is much lower.

Though evaluation of the duplicate sample analysis was based upon and EPA accepted method for calculating the relative percent difference between analytical results, this calculation is based upon actual values rather than orders of magnitude; whereas orders of magnitude are the accepted parameter for evaluation of all soil vapor data. For example, sample number 124 (duplicate sample 2124) exhibited the greatest relative percent difference for BTEX and GRO; however our interpretation of the two values would indicate that these samples exhibited the same response level. Visual inspection of the data indicates greater reproducibility than the relative percent difference calculations indicate.

The analytical results of the duplicate collectors are provided in Table B2, Appendix B.

9.0 DISCUSSION

9.1 Use of Soil Gas Data

Soil gas data (including PETREX) reflect volatile and semivolatile organics collected at a point in the near surface. The sources of these volatile organics may be in the stratigraphic column and/or in groundwater below the collection point. Thus, the organics can be derived from surface spills, deposition, or migration into the deeper vadose zone, and groundwater. The soil gas survey reveals the areal extent of contamination and is the optimum guide in identifying areas in order to develop a vertical profile, including the drilling of soil borings and monitoring wells. Soil gas data are always semi-quantitative in that multiple sources in soil and/or groundwater cannot be readily differentiated without supporting soil and groundwater data. However, the higher soil gas responses are representative of higher concentrations in the subsurface, given that subsurface geologic conditions are relatively consistent.

The data from a PETREX survey are reported as the ion counts for the mass spectral peak which indicates the presence and relative abundance of a compound. Ion count values are the unit of measure generated by mass spectrometers to illustrate the relative response of a particular compound which was present in the soil gas at the sample location site. A difference in ion count values of an order of magnitude or more is typically considered significant when interpreting potential source areas and migration/dispersion pathways versus background areas.

9.2 Evaluation of Relative Response

The soil gas response levels discussed in the following section are described as high, elevated or low relative to the entire data set. The ion count values that are reported represent semi-qualitative soil gas values that were evaluated relative to the other sampler locations. Background conditions are described when only low levels of the compounds identified were detected. Low levels are considered those which would not represent detectable levels by standard quantitative methods for soils and/or groundwater. In NERI's experience, levels below

100.000 ion counts for a single compound such as PCE. and levels below 200.000 ion counts for mixtures such as BTEX and GRO would not represent detectable subsurface concentration levels under normal site conditions. Normal site conditions are considered to be sites in which soil matrices are somewhat uniform, the depth to groundwater is less than 100 feet below the surface. groundwater flow rates are undisturbed, and normal precipitation and temperatures occur during sampler exposure.

The contour intervals depicted on Plates 2 - 4 were determined based upon groupings in the data observed in histograms formulated from the statistical distribution of the soil gas data. The histograms are shown as Figures D1-D3, Appendix D.

For a complete discussion of relative response evaluation. please refer to the PETREX Protocol. Appendix A.

9.3 Map Evaluation

9.3.1 The Distribution of Tetrachloroethene (PCE)

STUDY AREA 39

The distribution of PCE as detected in soil gas is shown on Plate 2, Appendix F. High soil gas response levels, which generally serve to depict potential source areas, were detected in the southeastern portion of the Study Area 39, west-northwest of the hazardous materials storage area and west of the ground maintenance building. Intermediate and lower response levels. which generally serve to depict migration or vapor diffusion pathways, indicate that PCE has migrated from the potential source area to the southwest. The areal extent of PCE occurrences appears to be limited and appears to have been defined by this investigation.

The confirmed identification of PCE at sample location 201 was not possible due to high levels of petroleum hydrocarbons detected at this location. PCE was most likely not detected at this location, as it was not detected in any of the surrounding samples.

STUDY AREA 40

PCE was not detected in Study Area 40.

9.3.2 The Distribution of Benzene, Toluene, Ethylbenzene/Xylene(s) (BTEX)

STUDY AREA 39

The distribution of BTEX as detected in soil gas is shown on Plate 3, Appendix F. High levels of BTEX response were identified at several locations in the southern portion of the Study Area 39. These areas include the vicinity of the hazardous materials storage area, an area adjacent to the culvert and grate located in the southwestern portion of the parking lot, and areas located north and northeast of the former coal staging area. Migration of BTEX from the vicinity of the hazardous materials storage area appears to be limited but may extend beyond the survey limits to the east; migration of BTEX in the vicinity of the culvert appears to follow a preferential pathway created by the utility corridor to the north; migration of BTEX in the south central portion of Study Area 39 appears to follow a linear east-west trend, and may indicate a preferential migration pathway created by an artificial conduit or subsurface conditions such as a change in lithology.

Isolated occurrences of BTEX were identified at samples located west of the grounds maintenance building and north of the storm drain located at the end of the retention pond. The environmental significance of discrete occurrences such as these is difficult to ascertain, however are not those normally associated with occurrences which would impact groundwater.

The soil gas response values for the detection of BTEX were falsely elevated at several sample locations by the presence of naturally occurring aromatic hydrocarbons sourced from terpenes. The presence of high levels of terpenes occasionally mask, and sometimes result in a false positive for the detection of BTEX. BTEX may also be naturally derived form terpenes. The soil gas response levels detected for BTEX in the surrounding samples are considered background levels; therefore only naturally existing hydrocarbons appear to have been detected at these locations. The samples in which terpenes were detected are indicated by a "NI - not identified" in Table B1, Appendix B, and on Plate 3, Appendix F.

STUDY AREA 40

Only a single occurrence of BTEX was identified in Study Area 40. This sample was located in the eastern ball field. The environmental significance of discrete occurrences such as these is difficult to ascertain, however are not those normally associated with occurrences which would impact groundwater.

9.3.3 The Distribution of Gasoline Range Organics (GRO)

STUDY AREA 39

The distribution of GRO as detected in soil gas is shown on Plate 4, Appendix F. The physio-chemical characteristics of the hydrocarbons which comprise GRO, render them less mobile in the subsurface and therefore may more clearly depict potential source areas of gasoline release than does BTEX. High soil gas response levels of GRO were identified in the south central portion of the survey area in areas located north and northeast of the former coal staging area and southeast of the ramps and dumpsters. Migration of GRO in the south central portion of Study Area 39 appears to follow a linear east-west trend, and may indicate a preferential migration pathway created by an artificial conduit or subsurface conditions such as a changes in lithology. GRO occurrences may extend beyond the limits of this investigation east of the hazardous materials storage area.

Isolated occurrences of GRO were also identified at samples located in the southwestern portion of the parking lot and north of the storm drain located at the end of the retention pond. As previously discussed, the environmental significance of discrete occurrences such as these is difficult to ascertain.

The soil gas response values for the detection of GRO were falsely elevated at several sample locations by the presence of naturally occurring aromatic hydrocarbons sourced from terpenes. The data surrounding these samples indicate that GRO were not detected at these locations: only naturally existing hydrocarbons sourced from terpenes were detected at these locations. The samples in which terpenes were detected are indicated by a "NI - not identified" in Table B1, Appendix B, and on Plate 4, Appendix F.

Study Area 40

Only limited occurrences of GRO were detected in Study Area 40. The detections were located northwest of the drainage ditch which runs parallel to Nautilus Street. As previously discussed, discrete occurrences such as these are not those normally associated with occurrences which would impact groundwater.

10.0 CONCLUSIONS

Tetrachloroethene (PCE) and petroleum hydrocarbon compounds related to a hydrocarbon mixture similar to gasoline were detected predominantly in Study Area 39. Occurrences of PCE, benzene, toluene, ethylbenzene/xylene(s) (BTEX) and Gasoline Range Organics (GRO) were reported and mapped. A potential source of PCE appears to have been identified northwest of the hazardous materials storage area and west of the ground maintenance building. PCE occurrence appear to be limited and were defined by this investigation. Potential source areas of BTEX and GRO include the vicinity of the hazardous materials storage area and areas located north and northeast of the former coal staging area. Migration of BTEX and GRO appears to trend east-west, and may indicate a preferential migration pathway created by an artificial conduit or a lithological changes. Occurrences of GRO and BTEX may extend beyond the limits of this investigation to the east, therefore the areal extent of petroleum hydrocarbons was not defined.

No VOCs or SVOCs indicative of widespread contamination in subsurface soils/groundwater were detected in Study Area 40.

11.0 Limitations

In connection with this survey and associated interpretation, only a limited scope of work was performed by NERI. Therefore, NERI maintains that it has not defined the scope of the environmental condition of the site. Professional judgments made within the context of this report are based on technical data made available to NERI. NERI assumes no responsibility for conditions which did not come to its actual knowledge, or conditions not generally recognized as environmentally unacceptable at the time this report was prepared. Furthermore, NERI assumes no responsibility for actions taken in response to the release of these findings.

APPENDIX A
PETREX PROTOCOL

PETREX ENVIRONMENTAL SOIL GAS PROTOCOL

INTRODUCTION

The PETREX Technique provides a means by which trace quantities of gases from subsurface derived organic contaminants can be detected and collected at the earth's surface. The Technique is integrative, thereby eliminating the short-term variations associated with other gas/vapor detection methods. The PETREX Technique directly collects and records a broad range of organic compounds emanating from subsurface sources.

SOIL GAS COLLECTOR PREPARATION

Adsorption collector wires (after construction) are cleaned by heating to 358° C in a high vacuum system. Wires are packed under an inert atmosphere in glass culture tubes. One collector out of every batch of thirty is checked for cleanliness by mass spectrometry. Another collector from the batch is checked for adsorptive capability. Based on the results, the batch of collectors is approved for release into the field.

SOIL GAS SAMPLER INSTALLATION

The sampler consists of two or three collectors, each a ferromagnetic wire coated with an activated charcoal adsorbent in a screw top glass culture tube. Each sampler is typically placed in a shallow hole, 14-18 inches deep. The hole is backfilled and the location is marked. The sampler is left in the ground from one to thirty days, then retrieved and sealed for transportation back to the laboratory for analysis.

The PETREX soil gas sampling technique is adaptable to various surface conditions commonly encountered within survey areas. These surfaces typically include concrete, asphalt, grass, and gravel. Two installation methods are routinely utilized to adapt to these surface conditions.

The first method utilizes a coring shovel for sampler installations in grass or otherwise loosely consolidated soil conditions. The shovel cores a 14 inch deep by 2 inch diameter hole in the surface soils.

PETREX soil gas samplers are placed (open end down) at the bottom of each core hole. The samplers are then backfilled with an aluminum foil plug and the original excavated soil. To complete installation, sample locations are marked with ribbon flagging and a numbered pin flag, as well as entered into a field notebook and plotted on a field map.

The second method of sampler installation utilizes an electric rotary hammer, equipped with an 18 inch by 1.5 inch diameter drill bit, for sampler installations under concrete, asphalt, or otherwise consolidated conditions. A hole is drilled through the surface to the dimensions of the drill bit equipped to the rotary hammer.

PETREX soil gas samplers are placed at the bottom of each drilled hole. For retrieval purposes, a cleaned galvanized steel wire is attached to each sampler. Aluminum foil is used to plug each hole to approximately two inches below grade. Then each hole is capped to grade with hydraulic cement. The hydraulic cement serves as protection from the external surface environment.

To complete sampler installation, sampler locations are marked with paint (where applicable), entered into a field notebook, and plotted on a field map.

SOIL GAS SAMPLER RETRIEVAL

PETREX soil gas samplers are retrieved following a time period that has allowed for the soil gas emanating from the subsurface environment of a survey area to equilibrate with the installed PETREX samplers. This time integration period is determined for each PETREX soil gas survey based on time calibration data or site conditions.

Retrieval operations are dependent on surface conditions and routinely consist of the following two methods.

The first method applies to grass covered or loosely consolidated soil conditions. A trowel is utilized to expose the backfilled samplers; then with a pair of tongs, the samplers are brought to the surface. At the surface, the samplers are sealed, cleaned, and labeled. Following retrieval, all debris are gathered and the core hole is backfilled with original material.

The second method applies to concrete, asphalt, or other consolidated surface conditions. A hammer and chisel is utilized to remove the hydraulic cement plug and expose the sampler. By means of the pre-attached retrieval wire, the sampler is brought to the surface. At the surface, the retrieval wire is removed and the sampler is sealed, cleaned, and labeled. Following retrieval, each drill hole is backfilled and patched with cement or asphalt.

TIME CALIBRATION SAMPLERS

Time calibration samplers are included in PETREX soil gas surveys, as appropriate. These samplers are included as a means of monitoring the loading rates of volatile and semivolatile organic compounds (VOCs and SVOCs) emanating from the soil gas at a survey area onto the PETREX collectors.

During PETREX sampler installation, two sets of three to five time calibration samplers are also installed at survey sample locations that best represent the range of soil gas response for the survey area. These representative locations are determined based on previous soils and/or groundwater studies and other site specific conditions such as gradient and potential source areas.

The first set of time calibration samplers are generally retrieved within a week or less following the initial installation and the second set one week later. Often, permanent on-site personnel are instructed to perform time calibration sampler retrieval.

Lengths of exposure periods of the survey samplers for each survey are determined based on the results of each respective set of time calibration samplers. Time calibration samplers are usually analyzed within 24 hours upon receipt at the laboratory. At the first indication of significant relative ion count intensities and significant total ion count values, the decision is made to retrieve the entire complement of survey samplers.

If there are no significant relative ion count intensities detected from the second set of time calibration samplers, then the survey samplers are allowed to equilibrate in the field for a maximum time period of up to 30 days. The average environmental PETREX soil gas survey requires a collector integration period of one day to two weeks.

METHOD QA/QC

Within every survey sampler, the two or three collector wires should have adsorbed identical compounds. Like compounds on separate collectors relate an acceptable quality assurance (QA) during the survey's analysis. The first wire is analyzed by Thermal Desorption/Mass Spectrometry (TD/MS). The data from the first wire is reported on the relative response maps. The second wire is retained for analysis by Thermal Desorption-Gas Chromatography/Mass Spectrometry (TD-GC/MS), if warranted by the initial TD/MS analysis of the second wire.

Approximately ten percent of the total PETREX survey samplers contain three collector wires. The third collector wire, a QC collector wire, is used by the operator to test the mass spectrometer's operating conditions prior to survey analysis. Some of these quality control (QC) collectors are also used to check the mass spectrometer sensitivity during survey analysis. In addition, the QC collector may be used to compare the reproducibility of the detected VOCS.

TRAVEL BLANKS

Two PETREX samplers, each containing a single collector wire, are included with each PETREX soil gas survey as travel blanks. These blanks are analyzed with the survey samplers to indicate whether there may have been contamination introduced to the survey samplers during installation or shipment. If compounds other than normal atmospherics (e.g., CO_2, H_2O, N_2, and Ar) are detected on the blanks, these results are taken into consideration in the data presentation. This process, an initial step to data interpretation, involves the correction of ion count values of the detected blank contaminants from the entire survey's data set. The resulting ion count values are provided on the relative response maps.

MASS SPECTROMETER TUNING

An Extranuclear Quadrupole C-50 Mass Spectrometer or similar instrument, equipped with a Curie-point pyrolysis/thermal desorption inlet, is used for collector analysis. Mass assignment and resolution are manually adjusted using a Perfluorotributylamine (PFTBA) standard or a built-in tuning program, depending on the instrument. A linear correction, based on the known spectrum of PFTBA, is calculated. This correction is applied to a second PFTBA spectrum. If correct mass (M/Z) values are obtained, the operator proceeds to the next tuning step. If not, Step 1 is repeated until correct masses are obtained.

Peak intensity ratios are set from the major peaks in the PFTBA spectrum using the following values:

Mass (M/Z)		Spectrum Intensities
69	=	100%
131	=	48% ± 5%
219	=	50% ± 5%

During tuning, the ion signal for mass (M/Z) 69 of PFTBA is measured at a preset sample pressure and detector voltage and compared to previous values at the same setting.

Electron energy is set to 70 electron volts. All other operating parameters, such as scans, scan range, and mass offset, are established in the computer program. These values may only be changed by the laboratory manager.

Tuning is performed at the beginning of a run so that an individual survey is analyzed at the same set of instrument conditions. The samplers are analyzed in random order.

LABORATORY ANALYSIS

Periodic machine background and blank PETREX collector analyses are performed to assure that there is no carry-over between successive collectors. If there are peaks present which are not related to atmospheric gases, the supervisor is notified and the mass spectrometer is shut down and cleaned as necessary.

A written sample number record is kept during the analysis to prevent accidental cross numbering. The mass spectrometer control program contains appropriate "flag statements" that prompt the operator with a warning if an input sample number has already been analyzed. The operator then checks the current number, along with the disk storage location of the previously entered number to identify the true numbering situation.

COMPOUND IDENTIFICATION

Compound identification is based on molecular weight, compound fragmentation, and isotope distribution, as applicable. Each VOC exhibits a unique mass spectral signature. NERI maintains a large library of spectra of individual compounds, accessible by computer. In addition, the company maintains a large library of mass spectra of commonly used chemical mixtures; e.g., gasolines, diesels, industrial oils and solvents, coatings, plastics, etc. These spectra are used to assist in both compound and mixture identifications.

The ion count response of an indicator peak(s), representative of the compound and away from interference by other compounds, is extracted for data presentation and mapping.

INTERPRETATION OF SOIL GAS DATA

Soil gas data (including PETREX) reflect volatile and semivolatile organics collected at a point in the near surface. The sources of these volatile organics may be in the stratigraphic column and/or in groundwater below the collection point. Thus, the organics can be derived from surface spills, deposition, or migration into the deeper vadose zone, and groundwater. The soil gas survey reveals the areal extent of contamination and is the optimum guide in identifying areas in order to develop a vertical profile, including the drilling of soil borings and monitoring wells.

Soil gas data are always semi-quantitative in that multiple sources in soil and/or groundwater cannot be differentiated. However, the higher ion responses are representative of higher concentrations in the subsurface, given that geologic conditions are relatively consistent.

Due to chemical differences between individual compounds, including their ability to both adsorb and desorb from the charcoal PETREX collector element, it is invalid to compare the ion count of a compound at one sampling location to that of another compound.

Patterns of compound distribution in the soil gas, as detected at the surface, can be strongly influenced by irregularities in the near surface and subsurface environment through which the soil gas diffuses. These irregularities include subsurface man-made structures, such as concrete foundations, drainage systems, and wells, and such naturally occurring structures as fractured and unfractured bedrock, clay, and shale lenses.

Other factors influencing the soil gas signal include ground and surface water, the free carbon content of soils, microbiotic activity in the soil, and natural and synthetic ground cover.

All of these factors indicate that the most powerful use of soil gas data is in reconnaissance: identifying and mapping the relative abundance of the widest array of chemical species and mixtures. Efforts to relate soil gas response directly to groundwater or soil contaminant concentrations is generally not regarded as productive owing to the assumptions that are required for heterogeneity and source distribution.

RELATIVE RESPONSE DETERMINATION AND MAPPING

The relative response values are reported as the ion counts of indicator peaks for any given compound or mixture. Sample locations on a base map are digitized as X-Y coordinates and ion counts for the reported compounds are plotted at respective locations.

Mapping of the ion counts occurs after contour intervals for each compound or component class are determined. In order to establish the contour intervals, factors such as statistical analysis of ion count distribution, physiochemical considerations, and component-source material relationships (if known) are taken into account for each compound or class, in each area, on an individual basis. Each map is then contoured by hand. The resultant contour zones for each compound or component class in each area are color coded on a relative basis depending on whether the data are interpreted to be of high, moderate to high, moderate, etc., intensity. The response values found on each of the response maps are color coded and contoured on this basis.

APPENDIX B
TABLES B1-B2

Table B1
PETREX Relative soil gas Response Values (in ion counts)
Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
1	13,956	3,791	4,658	ND	ND
2	Missing				
3	Missing				
4	ND	438	299	ND	ND
5	Missing				
6	Missing				
7	Missing				
8	Missing				
9	Missing				
10	ND	3,133	322	ND	ND
11	Missing				
12	Missing				
13	1,619	NI	NI	ND	ND
14	ND	ND	ND	ND	ND
15	1,924	NI	NI	ND	ND
16	1,200	ND	ND	ND	ND
17	354	NI	ND	ND	ND
18	ND	500	310	ND	ND
19	ND	1,786	817	ND	ND
20	ND	ND	ND	ND	ND
21	ND	ND	ND	ND	ND
22	536	1,716	630	ND	ND
23	955	517	ND	ND	ND
24	ND	1,036	359	ND	ND
25	ND	2,493	ND	ND	ND
26	ND	ND	ND	ND	ND
27	ND	552	ND	ND	ND
28	ND	ND	1,376	ND	ND
29	ND	9,813	422	ND	ND
30	397	ND	ND	ND	ND
31	417	3,283	7,787	ND	ND
32	365	ND	ND	ND	ND
33	ND	578	ND	ND	ND
34	ND	10,173	35,781	ND	ND
35	ND	664	477	ND	ND
36	ND	7,794	3,545	ND	ND
37	ND	4,429	2,888	ND	ND

Table B1
PETREX Relative soil gas Response Values (in ion counts)
Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
38	ND	446	973	ND	ND
39	ND	407	2,211	ND	ND
40	ND	327	ND	ND	ND
41	ND	ND	ND	ND	ND
42	ND	1.987	1.297	ND	ND
43	ND	2,670	282	ND	ND
44	525	2,035	456	ND	ND
45	ND	842	963	ND	ND
46	ND	ND	317	ND	ND
47	ND	ND	ND	ND	ND
48	ND	ND	ND	ND	ND
49	ND	7,549	1,709	ND	ND
50	ND	2,619	ND	ND	ND
51	ND	21.966	2.508	ND	ND
52	ND	ND	316	ND	ND
53	ND	ND	438	ND	ND
54	ND	926	ND	ND	ND
55	410	ND	ND	ND	ND
56	ND	ND	ND	ND	ND
57	ND	ND	364	ND	ND
58	1.052	1.229	762	ND	ND
59	ND	612	ND	ND	ND
60	ND	1,456	1.118	ND	ND
61	ND	ND	ND	ND	ND
62	ND	ND	ND	ND	ND
63	ND	378	ND	ND	ND
64	587	136.312	7,252	ND	ND
65	ND	3,791	1,923	ND	ND
66	ND	319	ND	ND	ND
67	ND	581	1.249	ND	ND
68	ND	3.851	370	ND	ND
69	ND	ND	ND	ND	ND
70	567	2,489	ND	ND	ND
71	ND	ND	ND	ND	ND
72	ND	ND	ND	ND	ND
73	543	3,800	3,009	ND	ND
74	406	2,273	579	ND	ND
75	521	5,902	2,584	ND	ND

Table B1

PETREX Relative soil gas Response Values (in ion counts)

Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
76	ND	ND	ND	ND	ND
77	ND	ND	ND	ND	ND
78	ND	ND	ND	ND	ND
79	ND	ND	ND	ND	ND
80	ND	ND	ND	ND	ND
81	ND	3,775	379	ND	ND
82	ND	1,927	1,985	ND	ND
83	ND	1.183	ND	ND	ND
84	ND	2,489	408	ND	ND
85	ND	ND	617	ND	ND
86	613	1.826	392	ND	ND
87	ND	ND	ND	ND	ND
88	ND	1,698	658	ND	ND
89	ND	1,480	320	ND	ND
90	ND	1,357	ND	ND	ND
91	ND	ND	830	ND	ND
92	ND	1.313	ND	ND	ND
93	444	2,259	354	ND	ND
94	ND	891	ND	ND	ND
95	ND	2.587	ND	ND	ND
96	ND	364	ND	ND	ND
97	ND	455	354	ND	ND
98	ND	1.702	ND	ND	ND
99	ND	ND	744	ND	ND
100	ND	ND	ND	ND	ND
101	ND	1,360	ND	ND	ND
102	ND	1,164	ND	ND	ND
103	ND	ND	ND	ND	ND
104	12.839	33,572	1,868	ND	ND
105	ND	531	388	ND	ND
106	ND	5.610	4,847	ND	ND
107	ND	ND	ND	ND	ND
108	ND	542	ND	ND	ND
109	ND	1,087	ND	ND	ND
110	ND	555	339	ND	ND
111	ND	351	ND	ND	ND
112	ND	549	344	ND	ND
113	330	5,695	797	ND	ND

Table B1

PETREX Relative soil gas Response Values (in ion counts)

Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
114	419	851	288	ND	ND
115	ND	369	352	ND	ND
116	345	624	ND	ND	ND
117	ND	8,078	3,339	ND	ND
118	ND	ND	ND	ND	ND
119	ND	436	298	ND	ND
120	ND	440	393	ND	ND
121	ND	120,391	832	ND	ND
122	ND	ND	344	ND	ND
123	ND	26,702	404,174	ND	ND
124	ND	927,948	62,799	ND	ND
125	ND	4,511	2,442	ND	ND
126	ND	12,187	1,215	ND	ND
127	2,390	1,393,722	327,202	ND	ND
128	ND	320,031	129,960	ND	ND
129	ND	11,907	7,687	ND	ND
130	ND	17,481	4,699	ND	ND
131	ND	4,560	815	ND	ND
132	10,059	97,794	113,810	ND	ND
133	79,796	51,968	36,973	ND	ND
134	ND	13,502	5,897	ND	ND
135	ND	2,674	ND	ND	ND
136	ND	1,194,729	51,464	ND	ND
137	ND	1,693,581	2,993,439	ND	ND
138	499	271,719	250,413	ND	ND
139	436	126,189	431,205	ND	ND
140	ND	135,204	198,487	ND	ND
141	402	22,656	167,665	ND	ND
142	ND	1,027,170	5,276,923	ND	ND
143	ND	538,218	563,639	ND	ND
144	848	NI	NI	ND	ND
145	ND	ND	ND	ND	ND
146	ND	ND	ND	ND	ND
147	ND	8,333	2,790	ND	ND
148	ND	222,456	312,817	ND	ND
149	ND	527,422	348,301	ND	ND
150	ND	120,358	426,263	ND	ND
151	10,842	NI	NI	ND	ND

Table B1
PETREX Relative soil gas Response Values (in ion counts)
Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
152	282	2,860	630	ND	ND
153	ND	137.728	54.260	ND	ND
154	ND	698,735	2,084.264	ND	ND
155	ND	666	468	ND	ND
156	1,066	ND	ND	ND	ND
157	1,502	ND	ND	ND	ND
158	6.623	ND	ND	ND	ND
159	ND	1.112	1.520	ND	ND
160	ND	117,847	1,432,010	ND	ND
161	ND	5.333,626	3,162.332	ND	ND
162	ND	6,418	3.221	ND	ND
163	ND	5.723	8.561	ND	ND
164	7,460	30,729	27,330	ND	ND
165	532	2,406,990	1,303,653	ND	ND
166	1,449	7,730	2,726	ND	ND
167	2,414	90,487	213,131	ND	ND
168	4,641	225,057	7,899	ND	ND
169	ND	ND	881	ND	ND
170	ND	95,270	3.554	ND	ND
171	808	4,566	782	ND	ND
172	38,026	198,646	379.814	ND	ND
173	963,856	27.217	322.887	ND	ND
174	255,684	10,028	48.319	ND	ND
175	1,171.370	ND	201.027	ND	ND
176	789,291	734,171	564,952	ND	ND
177	ND	1,323	3,887	ND	ND
178	1,153	54,288	328.059	ND	ND
179	ND	ND	ND	ND	ND
180	ND	1,685	3,562	ND	ND
181	ND	640	ND	ND	ND
182	446	287,886	693,491	ND	ND
183	169,921	944,220	1.565,281	ND	ND
184	3,029,710	3,407	653,306	ND	ND
185	1,048.120	1,173,041	280,031	ND	ND
186	21,705	344.223	228,074	ND	ND
187	499,523	5,356	80.251	203,062	ND
188	123,450	88,221	208,816	ND	ND
189	7,067	881,210	3,403,986	ND	ND

Table B1

PETREX Relative soil gas Response Values (in ion counts)

Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
190	ND	30,213	171,203	ND	ND
191	ND	552	ND	ND	ND
192	6,758	ND	414	ND	ND
193	16,537	38,328	321,998	ND	ND
194	ND	137,456	271,785	ND	ND
195	59,290	11,649	44,442	ND	ND
196	3,076	222,233	446,166	ND	ND
197	ND	997	986	ND	ND
198	ND	364	ND	ND	ND
199	ND	ND	2,232	ND	ND
200	ND	ND	ND	ND	ND
201	NI	6,828,930	19,851,990	ND	8,531,151
202	ND	ND	ND	ND	ND
203	ND	41,322	21,802	ND	ND
204	ND	4,960	2,456	ND	ND
205	ND	752	ND	ND	ND
206	ND	2,468	514	ND	ND
207	ND	917	962	ND	ND
208	ND	462	881	ND	ND
209	ND	ND	ND	ND	ND
210	ND	1,861	73,052	ND	ND
211	ND	693	260	ND	ND
212	303	ND	2,202	ND	ND
213	ND	ND	ND	ND	ND
214	ND	ND	ND	ND	ND
215	ND	6,001	5,375	ND	ND
216	ND	1,954	ND	ND	ND
217	ND	ND	ND	ND	ND
218	ND	7,095	851	ND	ND
219	ND	4,782	1,896	ND	ND
220	19,812	25,415	66,320	ND	ND
221	ND	553	ND	ND	ND
222	ND	ND	718	ND	ND
223	ND	370	ND	ND	ND
224	ND	390	ND	ND	ND
225	ND	378	ND	ND	ND
226	ND	11,415	121,345	ND	ND
227	ND	450	ND	ND	ND

Table B1
PETREX Relative soil gas Response Values (in ion counts)
Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
228	376	ND	ND	ND	ND
229	ND	598	ND	ND	ND
230	1,290	1,082	ND	ND	ND
231	ND	10,482	475	ND	ND
232	ND	4,162	45,590	ND	ND
233	ND	27,000	581	ND	ND
234	ND	ND	ND	ND	ND
235	2,750	ND	ND	ND	ND
236	ND	ND	ND	ND	ND
237	616	ND	479	ND	ND
238	ND	536	1,189	ND	ND
239	ND	ND	ND	ND	ND
240	ND	17,374	529,606	ND	ND
241	311	35,460	548,479	ND	ND
242	ND	ND	ND	ND	ND
243	1,001	7,084	12,425	ND	ND
244	ND	ND	ND	ND	ND
245	ND	686	461	ND	ND
246	ND	461	ND	ND	ND
247	ND	ND	ND	ND	ND
248	ND	ND	893	ND	ND
249	ND	454	ND	ND	ND
250	ND	ND	3,992	ND	ND
251	ND	ND	ND	ND	ND
252	ND	2,941	2,571	ND	ND
253	ND	845	1,993	ND	ND
254	ND	487	510	ND	ND
255	ND	ND	ND	ND	ND
256	ND	1,193	1,144	ND	ND
257	ND	2,171	1,211	ND	ND
258	ND	585	ND	ND	ND
259	ND	2,429	993	ND	ND
260	ND	374	447	ND	ND
261	ND	ND	ND	ND	ND
262	ND	2,396	1,475	ND	ND
263	ND	ND	5387	ND	ND
* 900	ND	ND	ND	ND	ND
* 901	ND	ND	ND	ND	ND

Table B1
PETREX Relative soil gas Response Values (in ion counts)
Study Areas 39 and 40 - Main Base of the Naval Training Area, Orlando, Florida

Sample	PCE	BTEX	GRO	Chlorofor	PAHs
* 902	ND	ND	ND	ND	ND
* 903	ND	ND	ND	ND	ND
* 904	ND	ND	ND	ND	ND
* 905	ND	ND	ND	ND	ND
* 906	ND	ND	ND	ND	ND
* 907	ND	ND	ND	ND	ND
* 908	ND	ND	ND	ND	ND
* 909	ND	ND	ND	ND	ND
* 910	ND	ND	ND	ND	ND
* 911	ND	ND	ND	ND	ND
* 912	ND	ND	ND	ND	ND
* 913	ND	ND	ND	ND	ND

LEGEND:

PCE - Tetrachloroethene
Indicator Mass Peak - 164

BTEX - Benzene, Toluene,Ethylbenzene/xylene(s)
Sum of the C6 - C8 Aromatics
Indicator Mass Peaks - 78. 92. 106

GRO - Gasoline Range Organics
Sum of the C4 - C9 Aliphatics
Indicator Mass Peaks - 56. 70, 84. 98, 112, 126

Chloroform -
Indicator Mass Peak - 83

PAHs - Polycyclic Aromatic Hydrocarbons
Sum of the C11 - C13 Polycyclicaromatics
Indicator Mass Peaks - 149. 163, 178

ND - Not Detected

NI - Not Indentified due to interference from terpenes

* QA/QC Travel Blank Sample

Ta[illegible]2

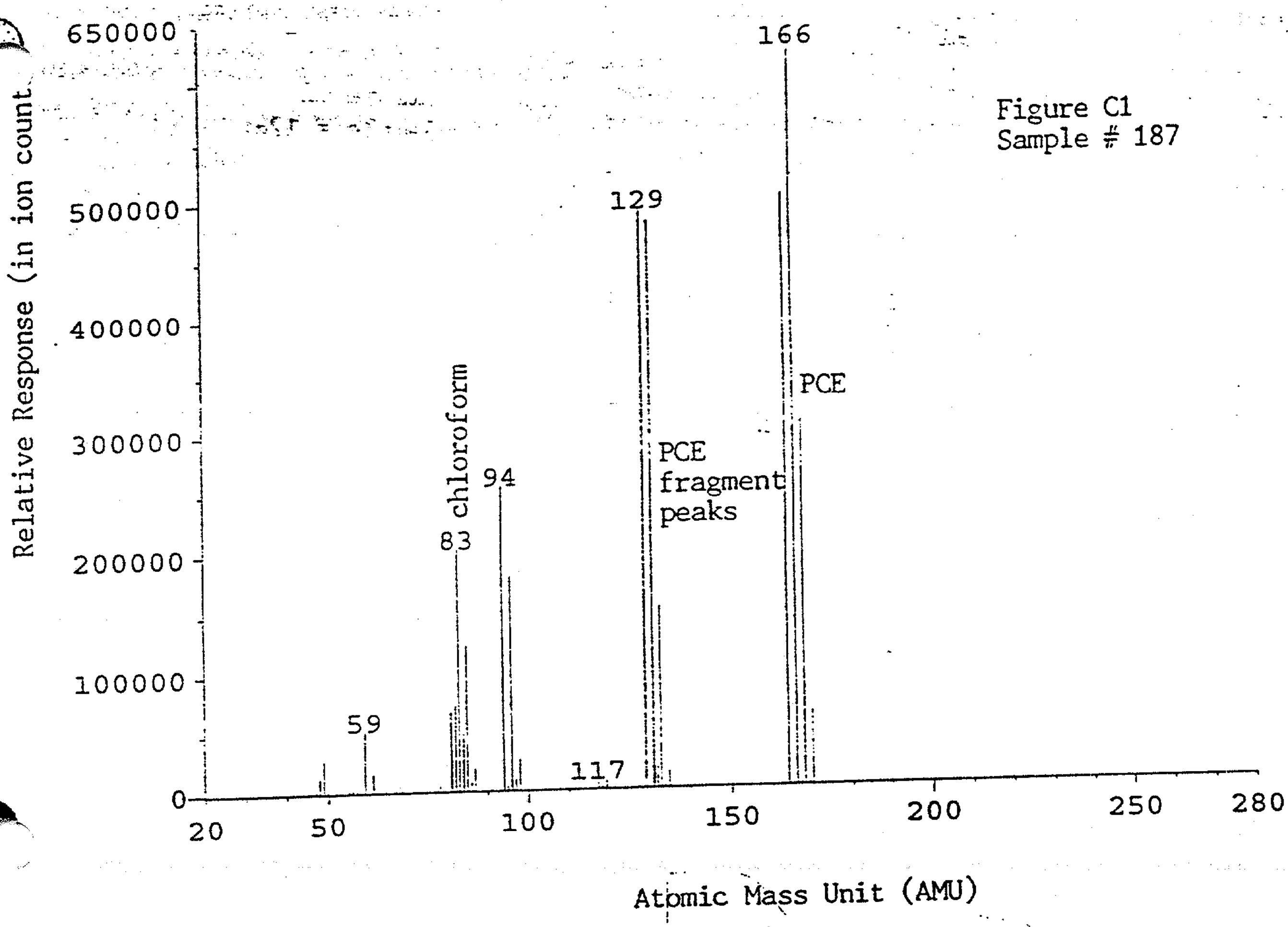
PETEX Duplicate S[illegible]ple Analytical Results

Study Areas 39 and 40 Naval Training Center- Orlando, Florida

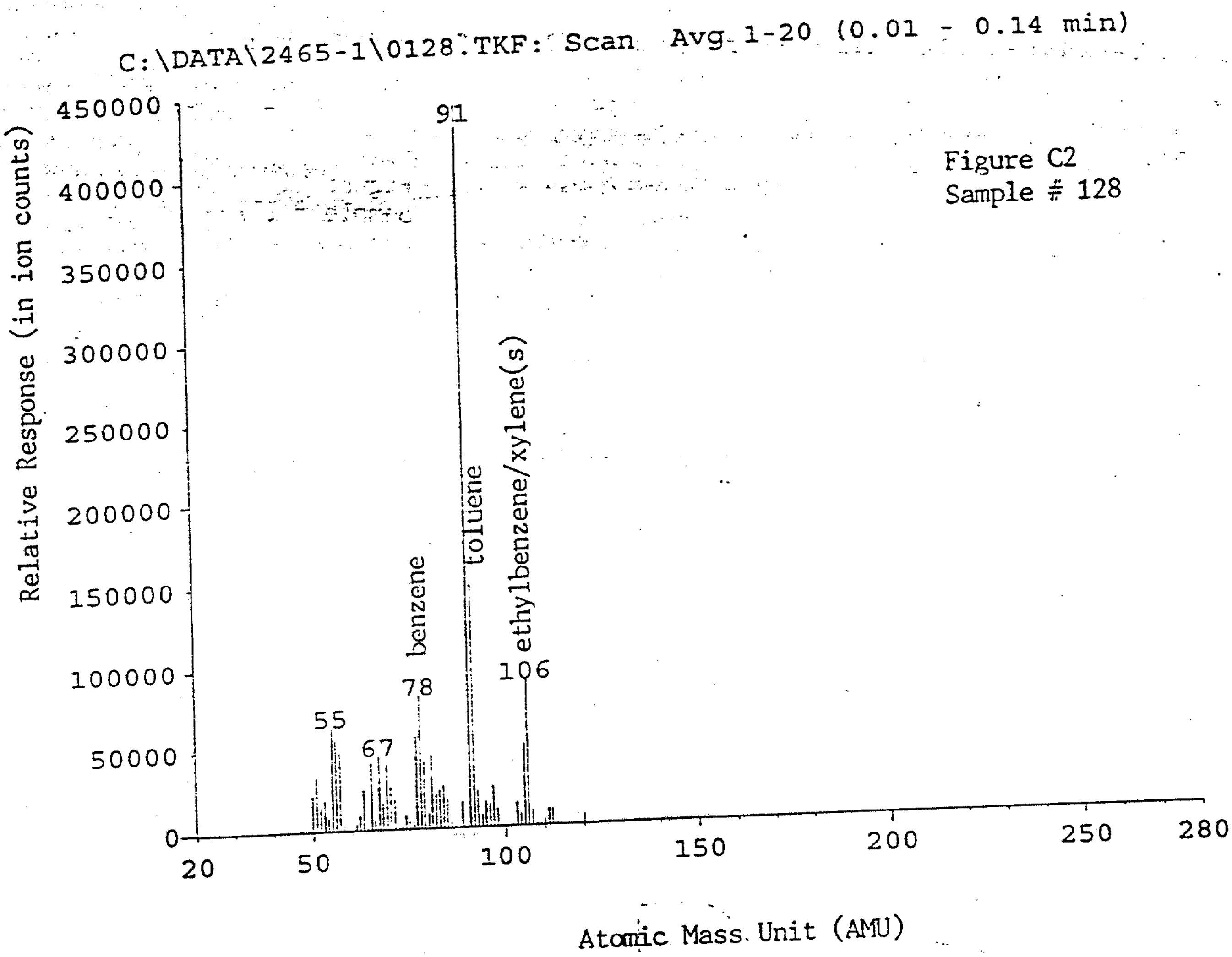
Soil Gas Sample	PCE	BTEX	GRO	Duplicate Sample	PCE	BTEX	GRO
27	ND	552	ND	2,027	ND	676	ND
40	ND	327	ND	2,040	ND	325	ND
49	ND	7,549	1,709	2,049	ND	5,242	4,152
52	ND	ND	316	2,052	ND	455	ND
53	ND	ND	438	2,053	ND	ND	ND
61	ND	ND	ND	2,061	ND	ND	ND
69	ND	ND	ND	2,069	ND	ND	ND
76	ND	ND	ND	2,076	ND	ND	ND
79	ND	ND	ND	2,079	ND	ND	ND
87	ND	ND	ND	2,087	ND	544	ND
100	ND	ND	ND	2,100	ND	ND	ND
109	ND	1,087	ND	2,109	ND	521	1,645
124	ND	927,948	62,799	2,124	ND	428,099	10,497
135	ND	2,674	ND	2,135	ND	3,125	ND
138	499	271,719	250,413	2,138	ND	297,920	273,576
166	1,449	7,730	2,726	2,166	520	2,661	675
181	ND	640	ND	2,181	ND	2,782	405
182	446	287,886	693,491	2,182	4,791	860,228	2,025,707
186	21,705	344,223	228,074	2,186	25,008	323,877	239,678
206	ND	2,468	514	2,206	ND	ND	341
218	ND	7,095	851	2,218	ND	3,775	2,386
224	ND	390	ND	2,224	ND	ND	384
231	ND	10,482	475	2,231	ND	1,933	381
242	ND	ND	ND	2,242	ND	315	ND
250	ND	ND	3,992	2,250	ND	ND	387
255	ND	ND	ND	2,255	ND	ND	ND
259	ND	2,429	993	2,259	ND	408	ND

APPENDIX C
SAMPLE MASS SPECTRA

C:\DATA\2465-1\0187.TKF: Scan Avg 1-20 (0.01 - 0.14 min)



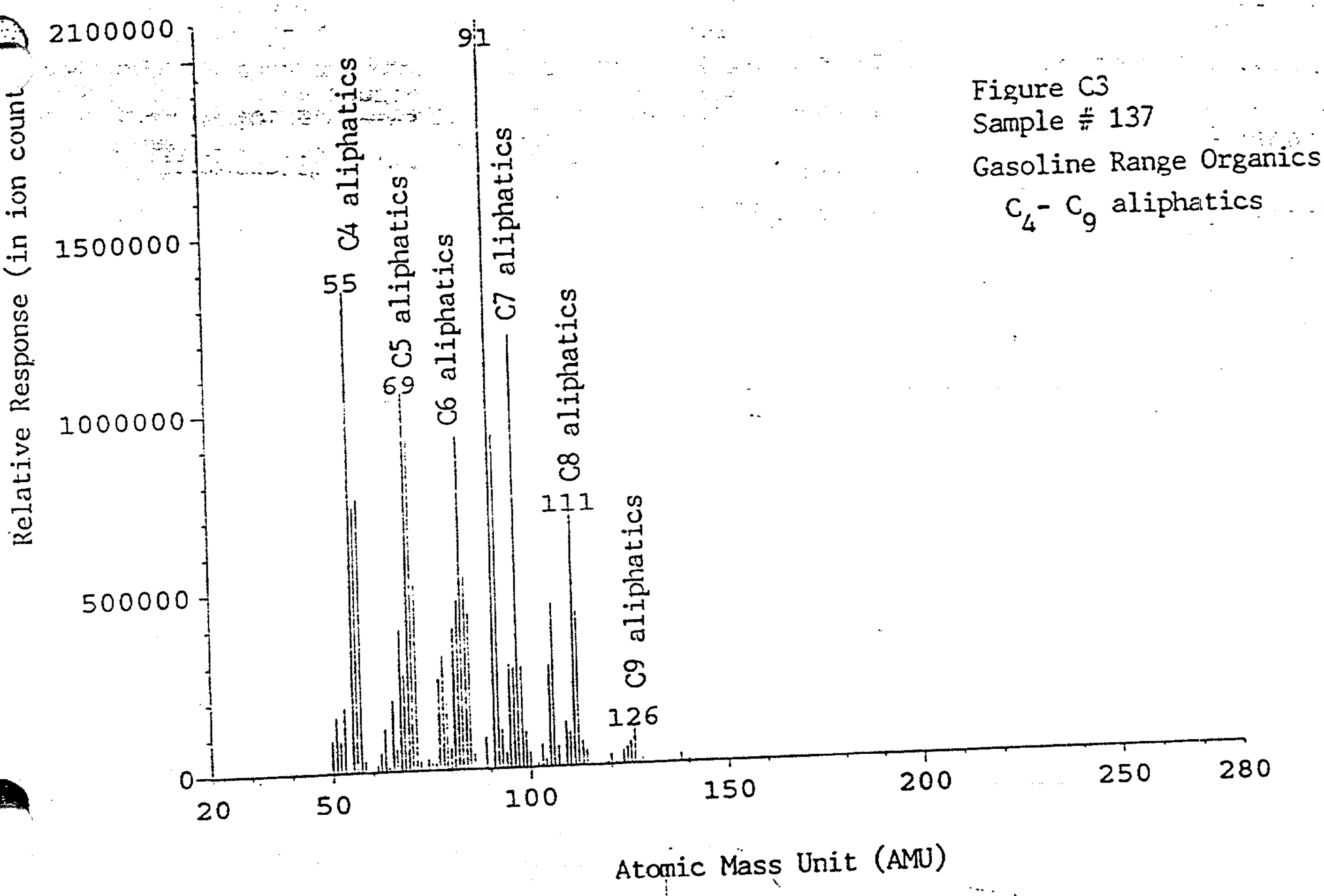
PlotData



C:\DATA\2465-1\0128.TKF: Scan Avg 1-20 (0.01 - 0.14 min)
Figure C2
Sample # 128
Relative Response (in ion counts)
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
91
toluene
ethylbenzene/xylene(s)
benzene
106
78
55
67
20
50
100
150
200
250
280
Atomic Mass Unit (AMU)

PlotData

C:\DATA\2465-1\0137.TKF: Scan Avg 1-20 (0.01 - 0.14 min)



PlotData

C:\DATA\2465-1\0201.TKF: Scan Avg 1-20 (0.01 - 0.14 min)

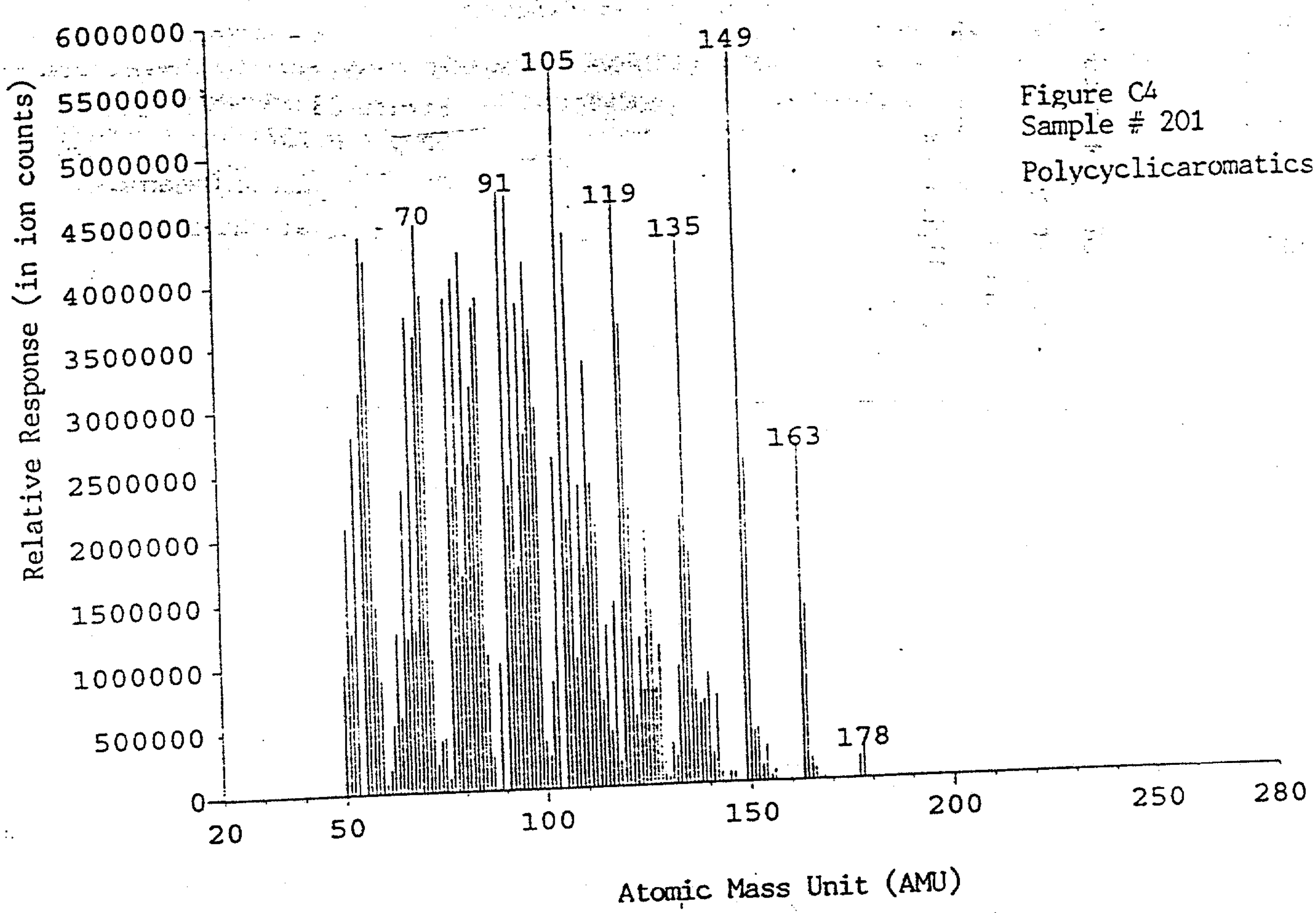
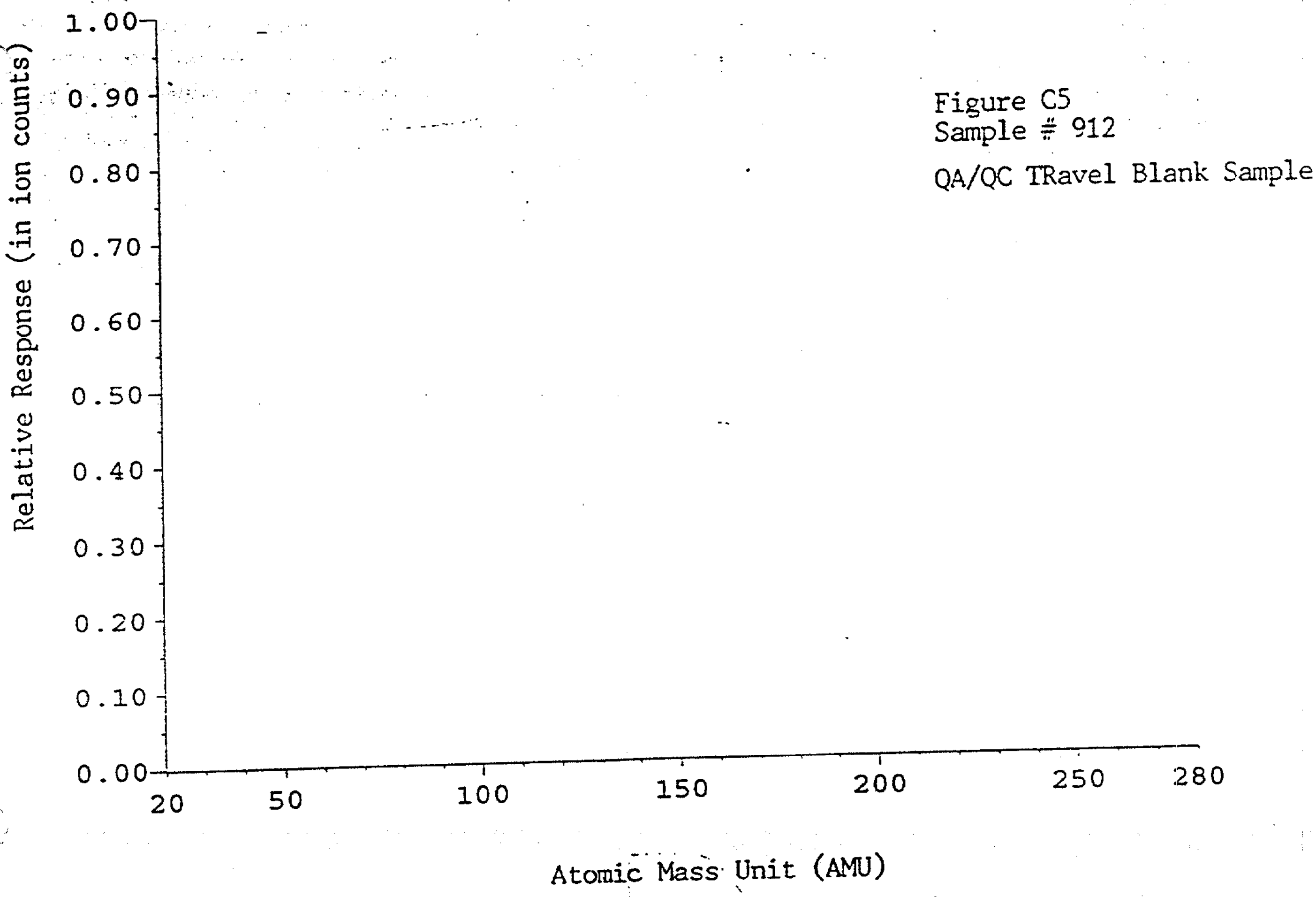


Figure C4
Sample # 201
Polycyclicaromatics

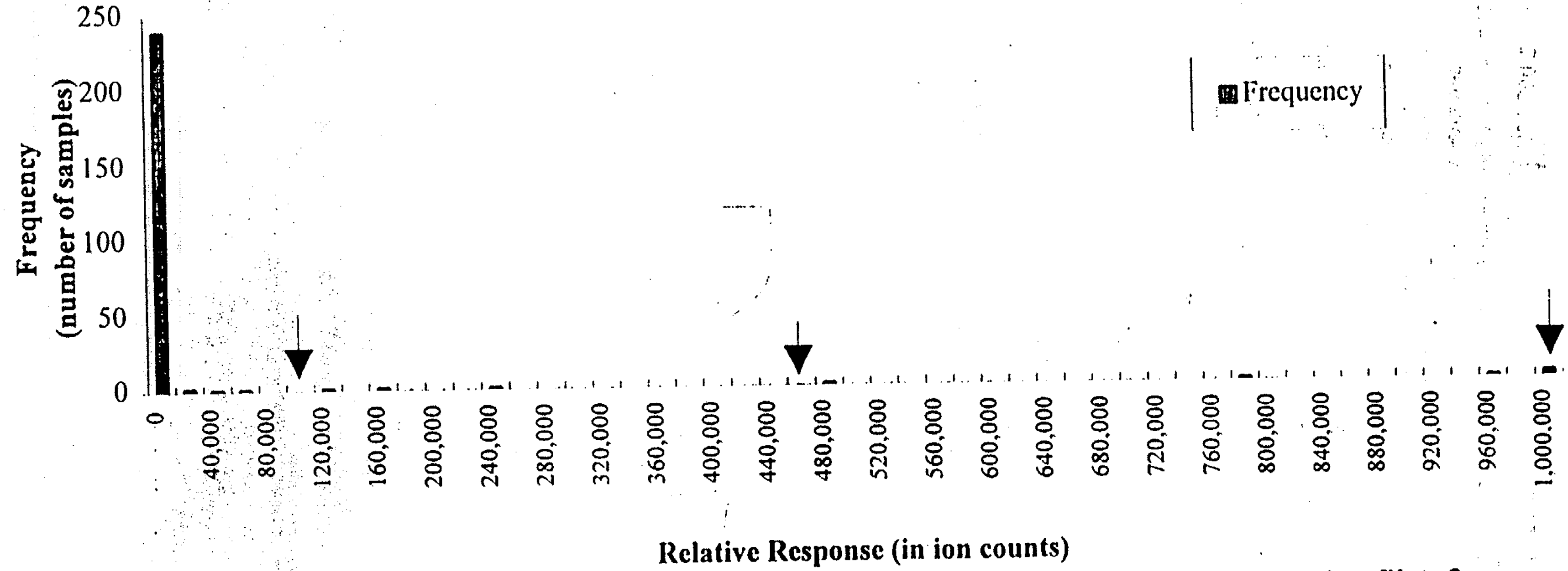
PlotData

C:\DATA\2465-1\0912.TKF: Scan Avg 1-20 (0.01 - 0.14 min)



APPENDIX D
HISTOGRAMS USED TO DETERMINE CONTOUR INTERVALS

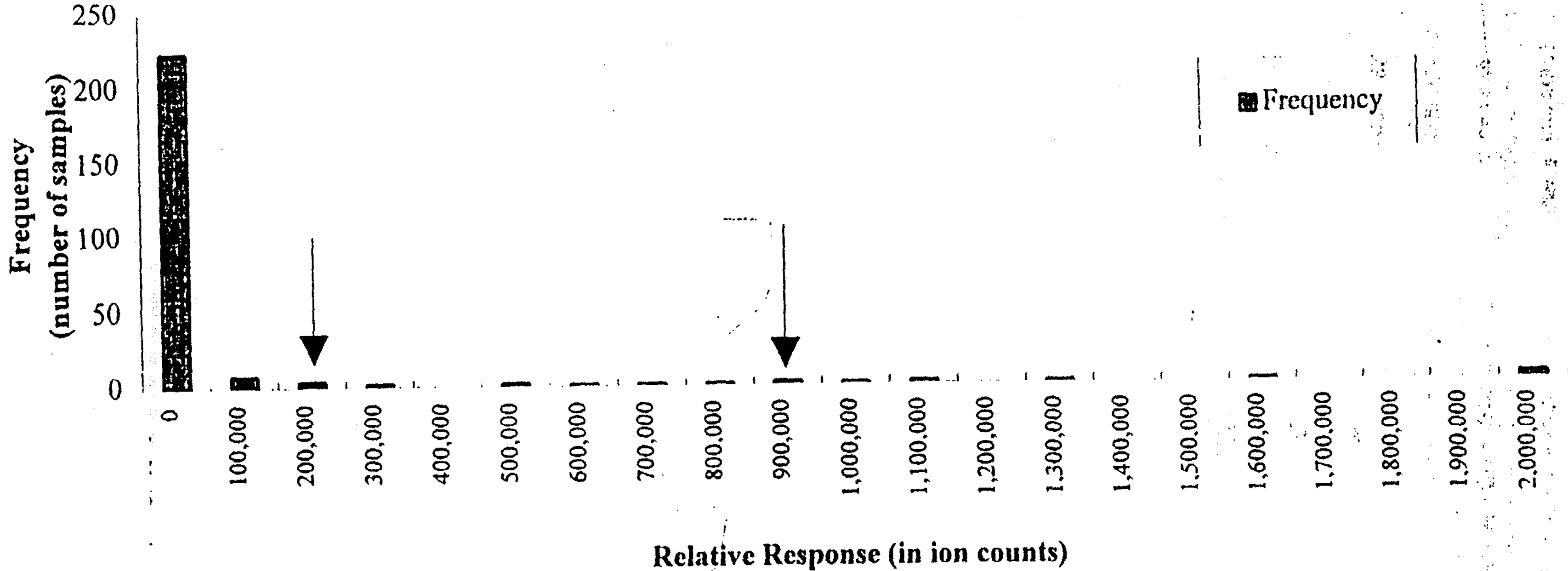
Figure D1
PCE Histogram



Arrows indicate sample population breaks used to establish contour intervals depicted on Plate 2.

2465pce.his

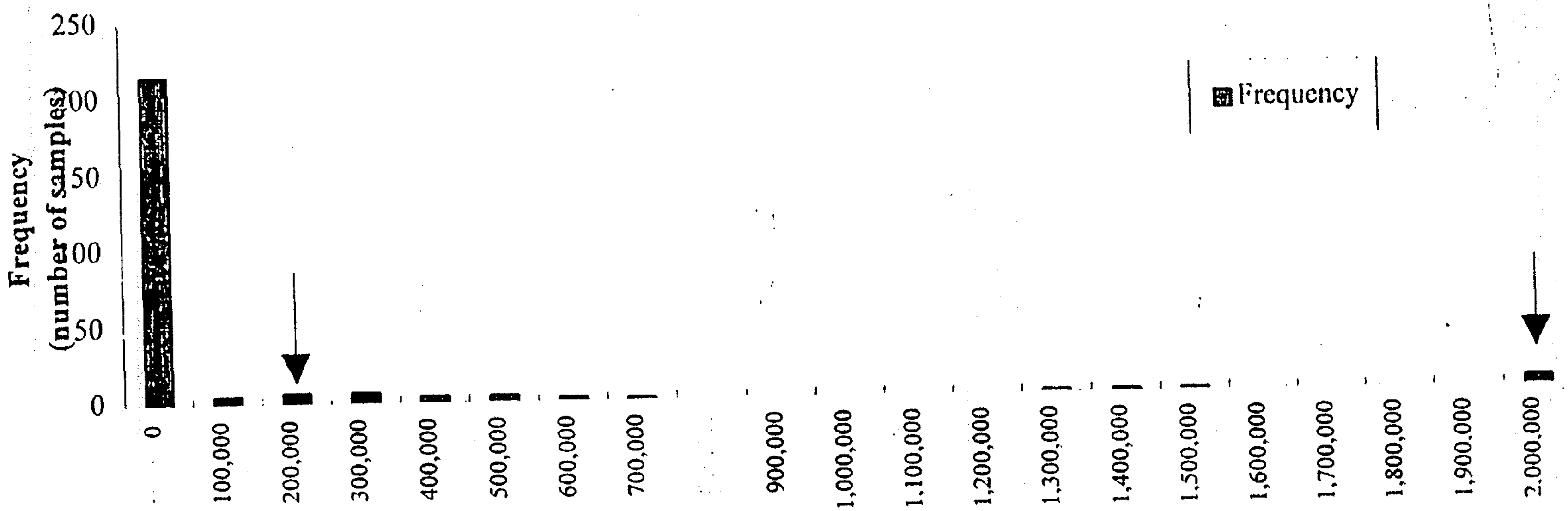
Figure D2
BTEX Histogram



Arrows indicate sample population breaks used to establish contour intervals depicted on Plate 3.

Figure D3

O Histogram



Rela[illegible] esponse (in ion counts)

Arrows indicate sample population [illegible] used to establish contour intervals depicted on Plate 4.

2465pro.his

APPENDIX E
CHAIN OF CUSTODY DOCUMENTS

NER
...heast Research Institute LLC

605 Parfet Street • Suite 100
Lakewood, Colorado 80215-5518
303-238-0090 • 800-845-5137
Fax 303-238-2522

Chain of Custody Document

Project Number: E 2465

Company: ABB Environmental Services, Inc.

Address: 2590 Executive Center Circle East
Berkeley Building
Tallahassee, Fl 32301

Contact: Mr. Lee W. Green Phone: (904) 656-1293

Number of Samples: 386 survey samples (40 True Duplicates),
16 TT, 17 Blanks (1 in ea bag), Sextra, Sempty

Date Shipped to Field: 2-1-96 By: DK

Client Use Only

Date Recvied in Field: 3/2/96 By: JMN
Condition Rec'd in Field Good
Date Shipped From Field: 3/4/96 By: JMN

Date Recieved from Field 3-5-96 By: UAP
Number of Samples Rec'd: 267
Condition as Rec'd in Lab: good

Notes:

NORTHEAST RESEARCH INSTITUTE, INC. (NERI)

SAMPLE SUBMITTAL CLIENT FORM

Please return this form with samples to:

NERI
605 Parfet Street
Suite 100
Lakewood, Colorado 80215

40 True Duplicates

*** Call with any questions: (303) 238-0090 ***

NERI PROJECT NUMBER: E 2465

NERI PROJECT MANAGER: ~~MAH~~ JOG

DATE SAMPLES SENT TO CLIENT: 2-1-96

Please provide the following information:

DATE SAMPLES SENT TO NERI: 3/4/96

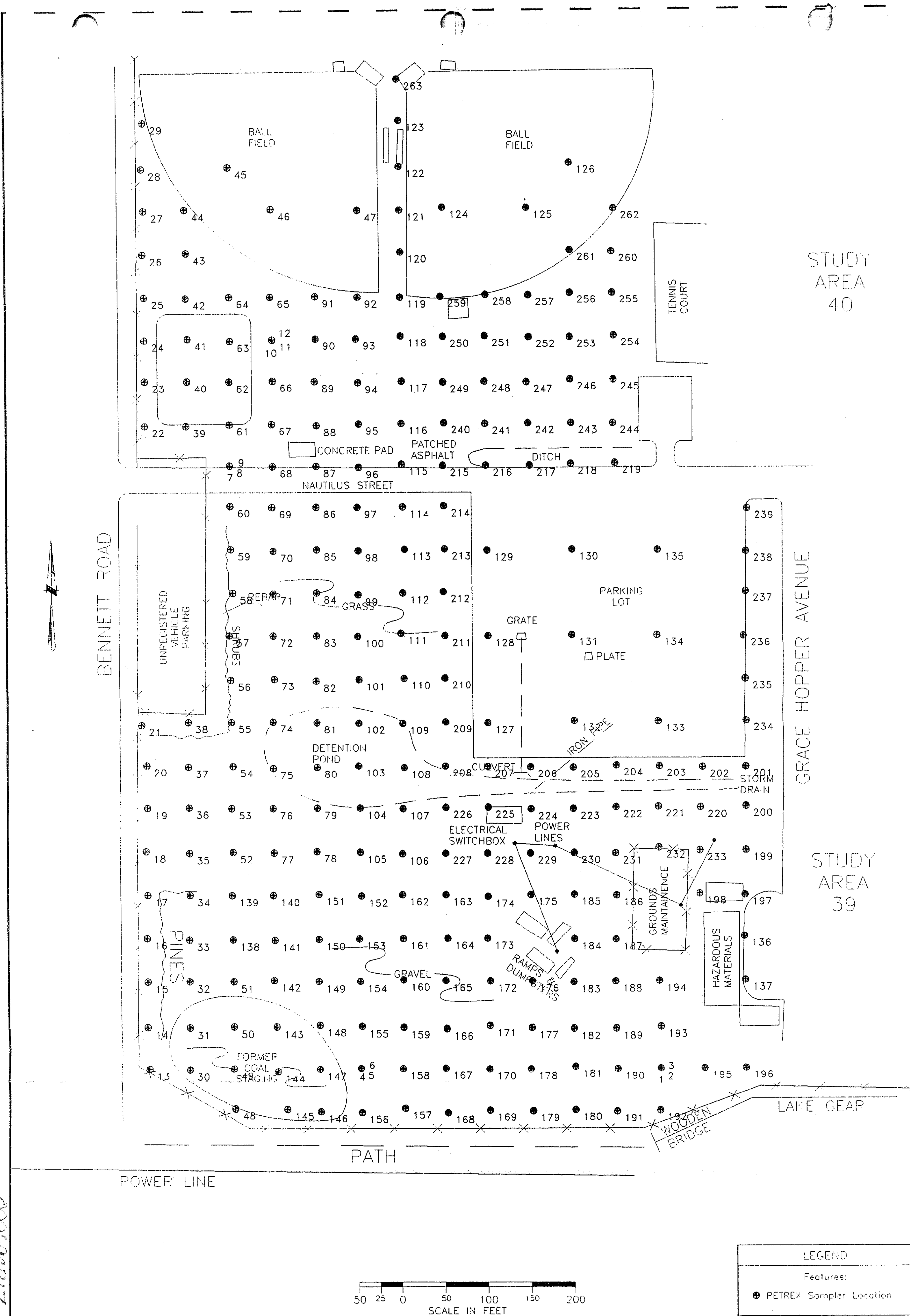
TOTAL NUMBER OF TUBES ENCLOSED: 254

GREATEST SAMPLE NUMBER: SG-263

MISSING SAMPLE NUMBERS: SG-7
Time Calibration Samples SG-2, SG-3, SG-5, SG-6, SG-8
SG-9, SG-11, SG-12 (already shipped)

NOTES:
Unused tubes enclosed

APPENDIX F
RELATIVE RESPONSE MAPS, PLATES 1-4

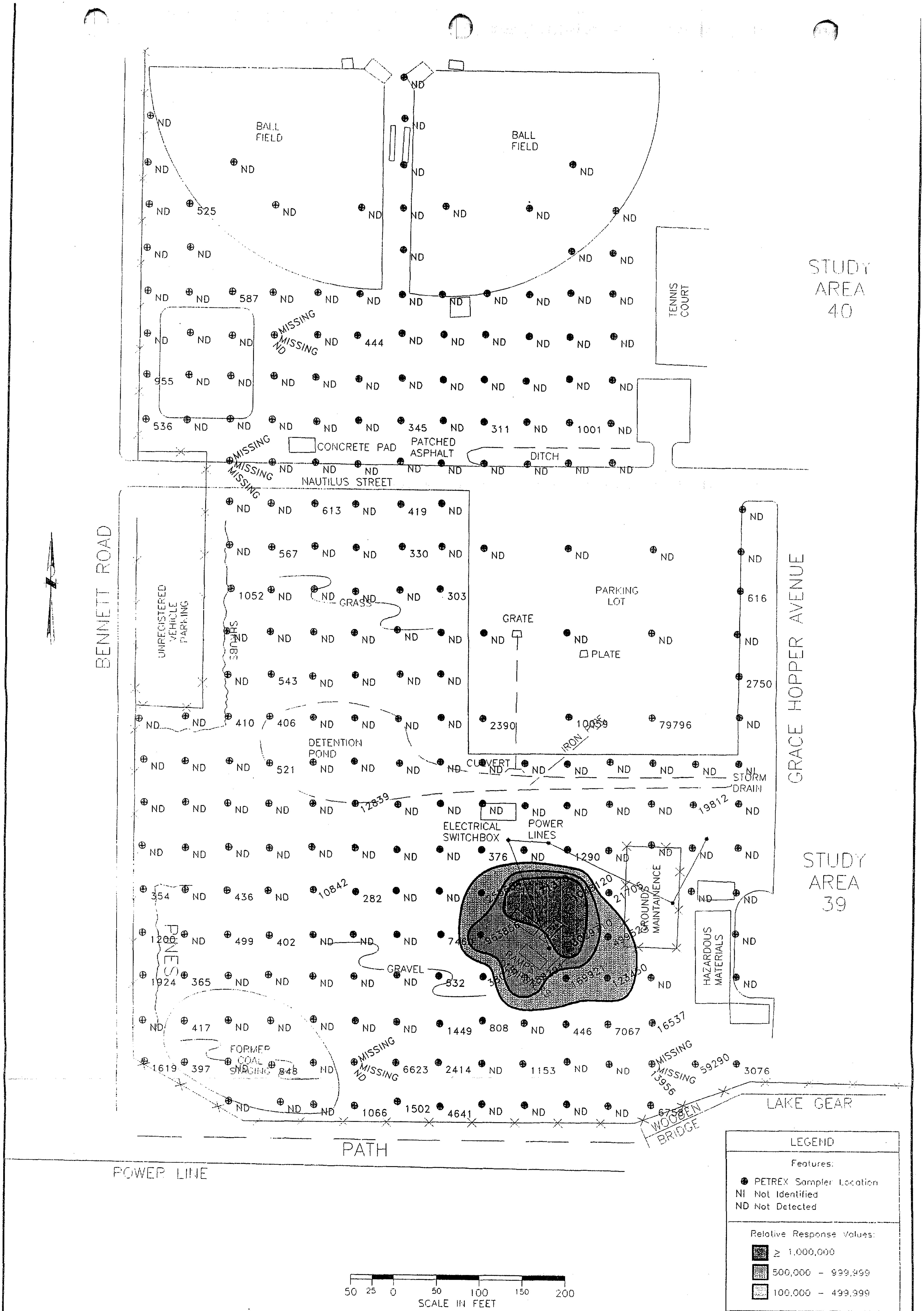


000690812

NER Northeast Research Institute LLC / PETREX FINGERPRINT TECHNOLOGY	Drawn By: KAL	Project #: 2465	ABB ENVIRONMENTAL SERVICES, INC.
	Checked By:	Date: 03/12/96	STUDY AREA 39 AND STUDY AREA 40 – MAIN BASE
	Project Mgr: JOG	File Name: 2465-1.DWG	Naval Training Center – Orlando, Florida

Sampler Locations

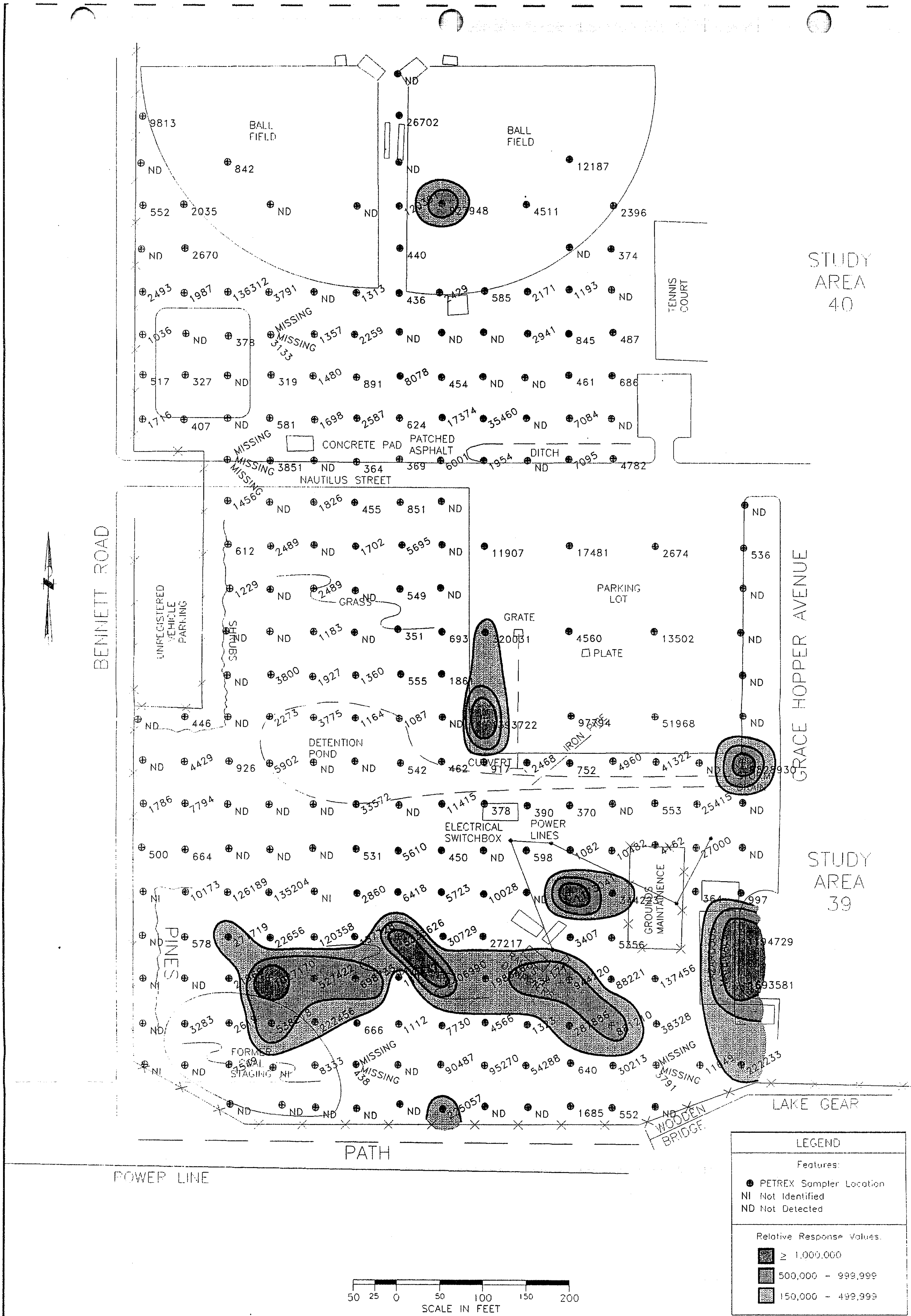
PLATE 1



NERI Northeast Research Institute LLC PETREX FINGERPRINT TECHNOLOGY	Drawn By: KAL Checked By: Project Mgr: JOG	Project #: 2465 Date: 03/12/96 File Name: 2465-2.DWG	ABB ENVIRONMENTAL SERVICES, INC. STUDY AREA 39 AND STUDY AREA 40 – MAIN BASE Naval Training Center – Orlando, Florida

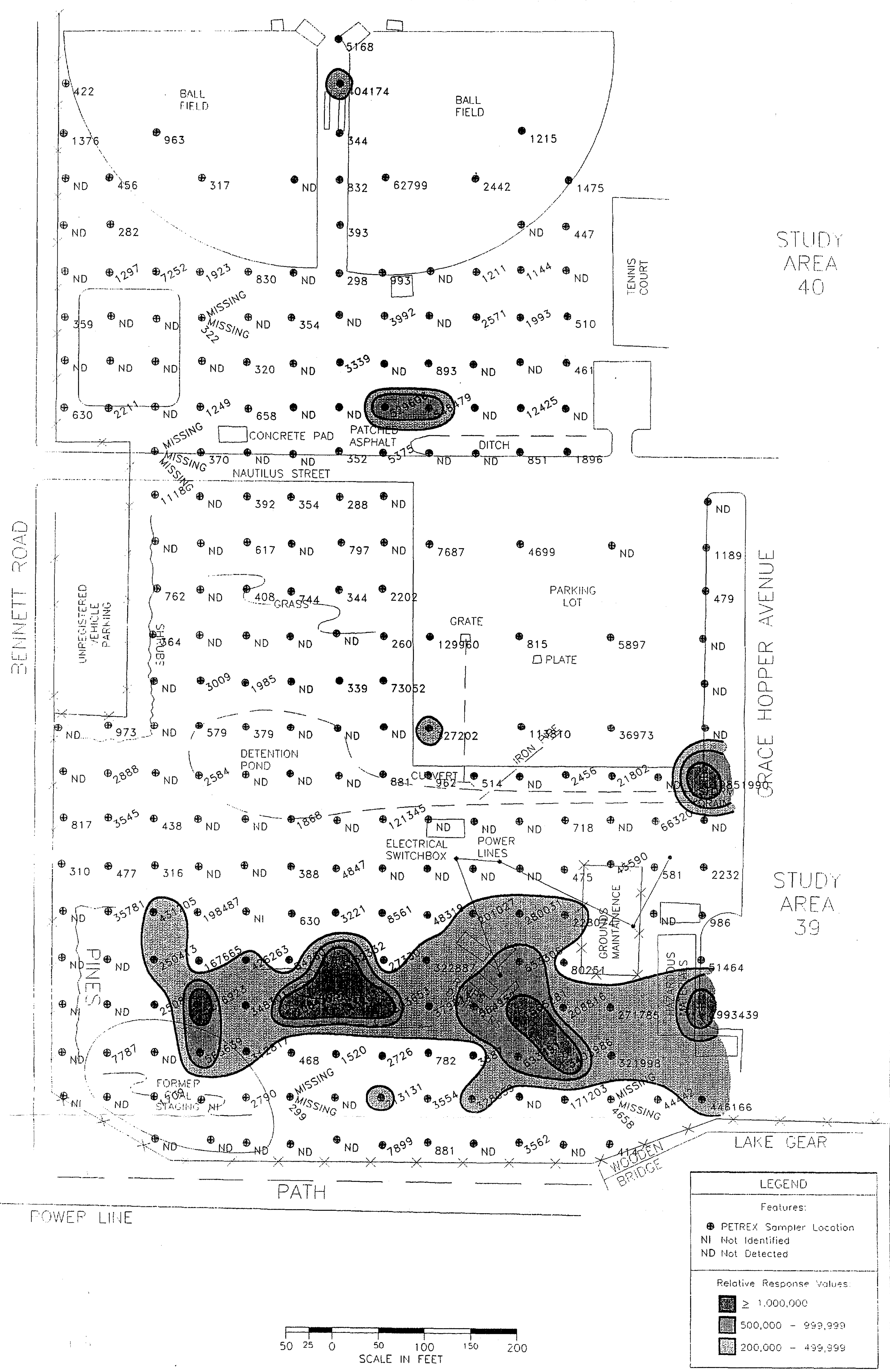
RELATIVE RESPONSE
Tetrachloroethene (PCE)

PLATE 2



NER Northeast Research Institute LLC / PETREX FINGERPRINT TECHNOLOGY	Drawn By: KAL / Checked By: / Project Mgr: JDG	Project #: 2465 / Date: 03/12/96 / File Name: 2465-3.DWG	**ABB ENVIRONMENTAL SERVICES, INC.** / STUDY AREA 39 AND STUDY AREA 40 – MAIN BASE / Naval Training Center – Orlando, Florida

RELATIVE RESPONSE
Benzene, Toluene, Ethylbenzene/Xylene(s) (BTEX)
PLATE 3



LEGEND

Features:

- ⊕ PETREX Sampler Location
- NI Not Identified
- ND Not Detected

Relative Response Values:

- ≥ 1,000,000
- 500,000 – 999,999
- 200,000 – 499,999

NER Northeast Research Institute LLC

PETREX FINGERPRINT TECHNOLOGY

Drawn By: KAL	Project #: 2465	ABB ENVIRONMENTAL SERVICES, INC.	RELATIVE RESPONSE
Checked By:	Date: 03/12/96	STUDY AREA 39 AND STUDY AREA 40 – MAIN BASE	C_4 – C_9 Cycloalkanes/Alkenes
Project Mgr: JOG	File Name: 2465-4.DWG	Naval Training Center – Orlando, Florida	PLATE 4

APPENDIX E

SUMMARY OF DETECTIONS TABLES (CLP LABORATORY)

TABLE E-1

SUMMARY OF DETECTIONS IN SURFACE SOIL ANALYTICAL RESULTS (CLP LABORATORY)

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B00101		39S00101		39B00201		39B00201D		39S00201		39B00301	
Sampling Date								19-Mar-96		20-Mar-96		19-Mar-96		19-Mar-96		20-Mar-96		19-Mar-96	
Sample depth (feet bls)								0-1		0-1		0-1		0-1		0-1		0-1	
Volatile organics, ug/kg																			
Carbon disulfide		200,000		7,800,000	n	200,000,000	n					4	J	3	J			1	J
Ethylbenzene		240,000		7,800,000	n	200,000,000	n	1	J										
Methylene chloride		16,000		85,000	c	760,000	n					6	J						
Tetrachloroethene		10,000		12,000	c	110,000	c											3	J
Toluene		300,000		16,000,000	n	410,000,000	n			42		1	J			6	J		
Xylene (total)		290,000		160,000,000	n	1,000,000,000	n	3	J	6	J					1	J	1	J
Semivolatile organics, ug/kg																			
1-Methylnaphthalene		290,000		ND		ND													
2-Methylnaphthalene		1,500,000		3,100,000	n	82,000,000	n					150	J	170	J				
Acenaphthene		2,300,000		4,700,000	n	120,000,000	n												
Acenaphthylene		1,100,000		2,300,000	n	61,000,000	n											39	J
Anthracene		19,000,000		23,000,000	n	610,000,000	n												
Benzo(a)anthracene		1,400		880	c	7,800	c					38	J	40	J			100	J
Benzo(a)pyrene		100		88	c	780	c							43	J			180	J
Benzo(b)fluoranthene		1,400		880	c	7,800	c					39	J	43	J			200	J
Benzo(g,h,i)perylene		2,300,000		2,300,000	n	61,000,000	n					49	J	49	J			150	J
Benzo(k)fluoranthene		15,000		8,800	c	78,000	c					37	J	37	J			140	J
Carbazole		53,000		32,000	c	290,000	c												
Chrysene		140,000		88,000	c	780,000	c					62	J	68	J			160	J
Dibenz(a,h)anthracene		100		88	c	780	c											47	J
Dibenzofuran		270,000		310,000	n	8,200,000	n					38	J	40	J				
Fluoranthene		2,800,000		3,100,000	n	82,000,000	n					50	J	52	J			91	J
Fluorene		2,100,000		3,100,000	n	82,000,000	n												
Indeno(1,2,3-cd)pyrene		1,500		880	c	7,800	c											120	J
Naphthalene		1,000,000		3,100,000	n	82,000,000	n					59	J	67	J				
Phenanthrene		1,900,000		2,300,000	n	61,000,000	n					140	J	150	J				
Pyrene		2,200,000		2,300,000	n	61,000,000	n	42	J			69	J	91	J			120	J
bis(2-Ethylhexyl)phthalate		75,000		46,000	c	410,000	c	47	J			49	J	170	J			43	J
Di-n-butylphthalate		110,000		7,800,000	n	200,000,000	n												
Pentachlorophenol		8,600		5300	c	43000	c												
Explosives, ug/g																			
2,4-Dinitrotoluene		1,300		160,000	n	4,100,000	n												
Pesticides/PCBs, ug/kg																			
4,4'-DDE		3,200		1900	c	17,000	c	1.8	J	3.6									
4,4'-DDT		4,500		1900	c	17,000	c	7.9											
alpha-Chlordane		3,000		490	c	4400	c	2.7	J										

Appendix E
Table E-1. Summary of Detections in Surface Soil Analytical Results
Study Area 39
Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B00101		39S00101		39B00201		39B00201D		39S00201		39B00301	
Sampling Date								19-Mar-96		20-Mar-96		19-Mar-96		19-Mar-96		20-Mar-96		19-Mar-96	
Sample depth (feet bls)								0-1		0-1		0-1		0-1		0-1		0-1	
Dieldrin		70		40	c	360	c	1.3	J	2.1	J								
gamma-Chlordane		3,000		490	c	4400	c	3.1											
Inorganics, mg/kg																			
Aluminum	2088	72,000		78,000	n	1,000,000	n	729	J	134	J	1440	J	1690	J	13.9	B	690	J
Arsenic	1	0.8		0.43 /23	c/n	3.8 /610	c/n	0.36	B	0.33	B	4.7		4.8				0.32	B
Barium	8.7	105		5,500	n	140,000	n	4.7	B	11.8	B	17.7	B	22.8	B	0.41	B	6.6	B
Beryllium	0.09	120.0		0.15	c	1.3	c	0.03	B			0.12	B	0.23	B			0.05	B
Cadmium		75		39	n	1000	n											0.51	B
Calcium	25295	ND		1,000,000		1,000,000		90600		2700		147000		151000		148	B	18900	
Chromium	4.6	290		390	n	10,000	n	3.5		0.71	B	6.9		7.5				1.7	B
Cobalt		4,700		4,700	n	120,000	n					2.4	B	4.8	B				
Copper	4.1	105		3,100	n	82,000	n	1.9	B	0.91	B	6.1		7.2				1.4	B
Iron	712	23,000		23,000	n	610,000	n	335		119		5770		7840		16.6	B	422	
Lead	14.5	500		400		400		14.5		8.6		21.5		24.3		0.51	B	17.6	
Magnesium	328	ND		460,468		460,468		702	B	38.3	B	1060	B	1040	B			136	B
Manganese	8.1	1,600		1800	n	47,000	n	11.7		5.1		34.1		46		0.38	B	6.5	
Mercury	0.07	3.7		23	n	610	n			0.07	B			0.07	B			0.05	B
Nickel	4.4	1,05		1,600	n	41,000	n					3.5	B	7.9	B				
Selenium	0.95	390		390	n	10,000	n	0.39	BJ			0.44	B	0.4	BJ				
Silver	1.8	390		390	n	10,000	n			0.96	B								
Sodium	91.4	ND		1,000,000		1,000,000						83.9	B	114	B			35.7	B
Thallium	2	ND		6.3	n	160	n	0.18	B										
Vanadium	3.1	15		550	n	14,000	n	6.6	B			9.5	B	10	B			1.4	B
Zinc	17.2	23,000		23,000	n	610,000	n	6.1		10.9		24.8		36		2.5	B	7.9	
Radiological, pCi/g																			
Gross Alpha	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Alpha, Uncertainty	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta, Uncertainty	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
General Chemistry, mg/kg																			
Total Petroleum Hydrocarbons	ND	350		ND		ND		26.1				70.8		74.1				9.3	

Appendix E
Table E-1 Summary of Detections in Surface Soil Analytical Results
Study Area 39
Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening[1]	[2]SCTL for Residential Soil		RBC[3] for Residential Soil		RBC[3] for Industrial Soil		39S00301		39S00301D		39B00401		39S00401		39B00501		39S00501	
Sampling Date								22-Mar-96		22-Mar-96		19-Mar-96		22-Mar-96		20-Mar-96		22-Mar-96	
Sample depth (feet bls)								0-1		0-1		0-1		0-1		0-1		0-0.5	
Volatile organics, ug/kg																			
Carbon disulfide		200,000		7,800,000	n	200,000,000	n									2	J		
Ethylbenzene		240,000		7,800,000	n	200,000,000	n												
Methylene chloride		16,000		85,000	c	760,000	n												
Tetrachloroethene		10,000		12,000	c	110,000	c												
Toluene		300,000		16,000,000	n	410,000,000	n					5	J	27		7	J	75	
Xylene (total)		290,000		160,000,000	n	1,000,000,000	n											5	J
Semivolatile organics, ug/kg																			
1-Methylnaphthalene		290,000		ND		ND													
2-Methylnaphthalene		1,500,000		3,100,000	n	82,000,000	n					210	J			350	J		
Acenaphthene		2,300,000		4,700,000	n	120,000,000	n									60	J		
Acenaphthylene		1,100,000		2,300,000	n	61,000,000	n												
Anthracene		19,000,000		23,000,000	n	610,000,000	n									180	J		
Benzo(a)anthracene		1,400		880	c	7,800	c					41	J			640		52	J
Benzo(a)pyrene		100		88	c	780	c					47	J			620		57	J
Benzo(b)fluoranthene		1,400		880	c	7,800	c					70	J			520		91	J
Benzo(g,h,i)perylene		2,300,000		2,300,000	n	61,000,000	n					65	J			300	J	59	J
Benzo(k)fluoranthene		15,000		8,800	c	78,000	c					49	J			530		70	J
Carbazole		53,000		32,000	c	290,000	c									120	J		
Chrysene		140,000		88,000	c	780,000	c					79	J			690		87	J
Dibenz(a,h)anthracene		100		88	c	780	c									110	J		
Dibenzofuran		270,000		310,000	n	8,200,000	n					56	J			120	J		
Fluoranthene		2,800,000		3,100,000	n	82,000,000	n					56	J			1300		73	J
Fluorene		2,100,000		3,100,000	n	82,000,000	n									51	J		
Indeno(1,2,3-cd)pyrene		1,500		880	c	7,800	c					45	J			290	J	49	J
Naphthalene		1,000,000		3,100,000	n	82,000,000	n					110	J			210	J		
Phenanthrene		1,900,000		2,300,000	n	61,000,000	n					150	J			1100		54	J
Pyrene		2,200,000		2,300,000	n	61,000,000	n					67	J			1400		120	J
bis(2-Ethylhexyl)phthalate		75,000		46,000	c	410,000	c							47	J				
Di-n-butylphthalate		110,000		7,800,000	n	200,000,000	n	40	J					170	J				
Pentachlorophenol		8,600		5300	c	43000	c												
Explosives, ug/g																			
2,4-Dinitrotoluene		1,300		160,000	n	4,100,000	n					0.29						NA	
Pesticides/PCBs, ug/kg																			
4,4'-DDE		3,200		1900	c	17,000	c							1.9	J			12	
4,4'-DDT		4,500		1900	c	17,000	c											14	N
alpha-Chlordane		3,000		490	c	4400	c							1.1	J			2.6	J

Appendix E

Table E-1 Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S00301		39S00301D		39B00401		39S00401		39B00501		39S00501	
Sampling Date								22-Mar-96		22-Mar-96		19-Mar-96		22-Mar-96		20-Mar-96		22-Mar-96	
Sample depth (feet bls)								0-1		0-1		0-1		0-1		0-1		0-0.5	
Dieldrin		70		40	c	360	c							1.2	J				
gamma-Chlordane		3,000		490	c	4400	c							0.78	J			2.7	J
Inorganics, mg/kg																			
Aluminum	2088	72,000		78,000	n	1,000,000	n	117		113		2430	J	408		875	J	1590	
Arsenic	1	0 8		0 43 /23	c/n	3.8 /610	c/n					6.7				2.3			
Barium	8 7	105		5,500	n	140,000	n					21.8	B	8.9	B	17.5	B	12.4	B
Beryllium	0.09	120.0		0.15	c	1.3	c					0.18	B	0.04	B	0.14	B	0.07	B
Cadmium		75		39	n	1000	n												
Calcium	25295	ND		1,000,000		1,000,000		357	B	492	B	5240		8720		67200		27200	
Chromium	4.6	290		390	n	10,000	n					2.9		1.1	B	3.7		3.7	
Cobalt		4,700		4,700	n	120,000	n					0.79	B			2.1	B		
Copper	4 1	105		3,100	n	82,000	n	1.3	B	1.6	B	4.4	B	3.5	B	4.8	B	5	B
Iron	712	23,000		23,000	n	610,000	n	58.5		60.3		2820		202		1930		762	
Lead	14 5	500		400		400						11.5		3.8		23.9		17.1	
Magnesium	328	ND		460,468		460,468		9.9	B	12.3	B	97.6	B	82.8	B	983	B	262	B
Manganese	8 1	1,600		1800	n	47,000	n	0.61	B	0.61	B	10.9		5.1		43.5		11.4	
Mercury	0 07	3.7		23	n	610	n							0.05	B				
Nickel	4 4	105		1,600	n	41,000	n					2.8	B			3.6	B		
Selenium	0 95	390		390	n	10,000	n					0.39	J	0.33	J			0.31	J
Silver	1 8	390		390	n	10,000	n												
Sodium	91 4	ND		1,000,000		1,000,000										76.2	B		
Thallium	2	ND		6.3	n	160	n					0.19	B						
Vanadium	3.1	15		550	n	14,000	n					2.3	B	1.2	B	3.4	B	1.9	B
Zinc	17.2	23,000		23,000	n	610,000	n	4.5		5.6		20.8		8		21.6		24.3	
Radiological, pCi/g																			
Gross Alpha	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Alpha, Uncertainty	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta, Uncertainty	ND	ND		ND		ND		NA		NA		NA		NA		NA		NA	
General Chemistry, mg/kg																			
Total Petroleum Hydrocarbons	ND	350		ND		ND						4.7		4.7		48.1		26.5	

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S00501D		39S00601		39S00701		39S00801		39S01001		39S01101	
Sampling Date								22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		29-Aug-96		29-Aug-96	
Sample depth (feet bls)								0-0.5		0-1		0-1		0-1		0-2		0-2	
Volatile organics, ug/kg																			
Carbon disulfide		200,000		7,800,000	n	200,000,000	n									NA		NA	
Ethylbenzene		240,000		7,800,000	n	200,000,000	n									NA		NA	
Methylene chloride		16,000		85,000	c	760,000	n									NA		NA	
Tetrachloroethene		10,000		12,000	c	110,000	c									NA		NA	
Toluene		300,000		16,000,000	n	410,000,000	n	86		76		83		59		NA		NA	
Xylene (total)		290,000		160,000,000	n	1,000,000,000	n	5	J	4	J	4	J	2	J	NA		NA	
Semivolatile organics, ug/kg																			
1-Methylnaphthalene		290,000		ND		ND										NA		NA	
2-Methylnaphthalene		1,500,000		3,100,000	n	82,000,000	n	44	J					48	J	NA		NA	
Acenaphthene		2,300,000		4,700,000	n	120,000,000	n									NA		NA	
Acenaphthylene		1,100,000		2,300,000	n	61,000,000	n			61	J					NA		NA	
Anthracene		19,000,000		23,000,000	n	610,000,000	n									NA		NA	
Benzo(a)anthracene		1,400		880	c	7,800	c	66	J	110	J	310	J			NA		NA	
Benzo(a)pyrene		100		88	c	780	c	78	J	200	J	350	J			NA		NA	
Benzo(b)fluoranthene		1,400		880	c	7,800	c	92	J	250	J	450				NA		NA	
Benzo(g,h,i)perylene		2,300,000		2,300,000	n	61,000,000	n	79	J	220	J	190	J			NA		NA	
Benzo(k)fluoranthene		15,000		8,800	c	78,000	c	81	J	190	J	380				NA		NA	
Carbazole		53,000		32,000	c	290,000	c					61	J			NA		NA	
Chrysene		140,000		88,000	c	780,000	c	110	J	290	J	540		44	J	NA		NA	
Dibenz(a,h)anthracene		100		88	c	780	c			48	J	75	J			NA		NA	
Dibenzofuran		270,000		310,000	n	8,200,000	n									NA		NA	
Fluoranthene		2,800,000		3,100,000	n	82,000,000	n	91	J	190	J	710	J	39	J	NA		NA	
Fluorene		2,100,000		3,100,000	n	82,000,000	n									NA		NA	
Indeno(1,2,3-cd)pyrene		1,500		880	c	7,800	c	56	J	160	J	210	J			NA		NA	
Naphthalene		1,000,000		3,100,000	n	82,000,000	n									NA		NA	
Phenanthrene		1,900,000		2,300,000	n	61,000,000	n	59	J	59	J	410	J	47	J	NA		NA	
Pyrene		2,200,000		2,300,000	n	61,000,000	n	130	J	220	J	780		36	J	NA		NA	
bis(2-Ethylhexyl)phthalate		75,000		46,000	c	410,000	c	100	J	41	J					NA		NA	
Di-n-butylphthalate		110,000		7,800,000	n	200,000,000	n	73	J	100	J			200	J	NA		NA	
Pentachlorophenol		8,600		5300	c	43000	c									NA		NA	
Explosives, ug/g																			
2,4-Dinitrotoluene		1,300		160,000	n	4,100,000	n	NA		NA		NA		NA		NA		NA	
Pesticides/PCBs, ug/kg																			
4,4'-DDE		3,200		1900	c	17,000	c	11				5.3	J	2.3	J	NA		NA	
4,4'-DDT		4,500		1900	c	17,000	c	13				11		4.2	J	NA		NA	
alpha-Chlordane		3,000		490	c	4400	c	1.9	J			20				NA		NA	

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S00501D		39S00601		39S00701		39S00801		39S01001		39S01101	
Sampling Date							22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		29-Aug-96		29-Aug-96	
Sample depth (feet bls)							0-0.5		0-1		0-1		0-1		0-2		0-2	
Dieldrin		70	40	c	360	c									NA		NA	
gamma-Chlordane		3,000	490	c	4400	c	1.9	J			18				NA		NA	
Inorganics, mg/kg																		
Aluminum	2088	72,000	78,000	n	1,000,000	n	1660		1110		3460		476		NA		NA	
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n									NA		NA	
Barium	8.7	105	5,500	n	140,000	n	15.3	B	6.4	B	26.5	B	4.7	B	NA		NA	
Beryllium	0.09	120.0	0.15	c	1.3	c	0.1	B	0.05	B	0.09	B	0.04	B	NA		NA	
Cadmium		75	39	n	1000	n									NA		NA	
Calcium	25295	ND	1,000,000		1,000,000		27000		43000		37600		4580		NA		NA	
Chromium	4.6	290	390	n	10,000	n	3.6		3.4		7.2		1.1	B	NA		NA	
Cobalt		4,700	4,700	n	120,000	n									NA		NA	
Copper	4.1	105	3,100	n	82,000	n	8.4		3.5	B	3.8	B	2	B	NA		NA	
Iron	712	23,000	23,000	n	610,000	n	928		682		361		349		NA		NA	
Lead	14.5	500	400		400		16.1		8.8		14.9		5.3		NA		NA	
Magnesium	328	ND	460,468		460,468		244	B	330	B	328	B	71.4	B	NA		NA	
Manganese	8.1	1,600	1800	n	47,000	n	14.1		10		9.4		5.6		NA		NA	
Mercury	0.07	3.7	23	n	610	n									NA		NA	
Nickel	4.4	105	1,600	n	41,000	n									NA		NA	
Selenium	0.95	390	390	n	10,000	n									NA		NA	
Silver	1.8	390	390	n	10,000	n									NA		NA	
Sodium	91.4	ND	1,000,000		1,000,000										NA		NA	
Thallium	2	ND	6.3	n	160	n									NA		NA	
Vanadium	3.1	15	550	n	14,000	n	2.1	B	2.2	B	2.6	B	0.69	B	NA		NA	
Zinc	17.2	23,000	23,000	n	610,000	n	30.6		30.3		21.3		8.8		NA		NA	
Radiological, pCi/g																		
Gross Alpha	ND	ND	ND		ND		NA		NA		NA		NA		0.86		0.57	
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA		NA		NA		NA		0.14		0.1	
Gross Beta	ND	ND	ND		ND		NA		NA		NA		NA		1.48		0.73	
Gross Beta, Uncertainty	ND	ND	ND		ND		NA		NA		NA		NA		0.2		0.12	
General Chemistry, mg/kg																		
Total Petroleum Hydrocarbons	ND	350	ND		ND		29.8		24.5		101		9.8		NA		NA	

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S01101D	39S01801	39S02501	39S02701	39S02901	39S03101
Sampling Date							29-Aug-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96
Sample depth (feet bls)							0-2	0-1	0-1	0-1	0-1	0-1
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		NA	6.5	2.5	8		70
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	NA	10	4.5	11	2.5	48
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	NA					
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	NA	5.5	16	36	3	12
Anthracene		19,000,000	23,000,000	n	610,000,000	n	NA	10	39	60	12	14
Benzo(a)anthracene		1,400	880	c	7,800	c	NA	18	20	6.5	2.5	20
Benzo(a)pyrene		100	88	c	780	c	NA	30	43	70	4.5	48
Benzo(b)fluoranthene		1,400	880	c	7,800	c	NA	7.5	10	18		13
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	NA	5	8.5	16		7.5
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	NA	7.5	10	18		13
Carbazole		53,000	32,000	c	290,000	c	NA					
Chrysene		140,000	88,000	c	780,000	c	NA	20	26	32	3	24
Dibenz(a,h)anthracene		100	88	c	780	c	NA					
Dibenzofuran		270,000	310,000	n	8,200,000	n	NA					
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	NA	24	23	20	3.5	18
Fluorene		2,100,000	3,100,000	n	82,000,000	n	NA	3		3		4
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	NA	7	8.5	14		6
Naphthalene		1,000,000	3,100,000	n	82,000,000	n	NA	7.5	4.5	8.5	3	17
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	NA	14	10	16	4.5	60
Pyrene		2,200,000	2,300,000	n	61,000,000	n	NA	26	44	70	4	28
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S01101D	39S01801	39S02501	39S02701	39S02901	39S03101
Sampling Date							29-Aug-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96
Sample depth (feet bls)							0-2	0-1	0-1	0-1	0-1	0-1
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n	NA	NA	NA	NA	NA	NA
Barium	8.7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		0.69	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		0.14	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		0.72	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		0.13	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2] SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S03901	39S04301	39S05101	39S05501	39S05901	39S06001
Sampling Date							2-Dec-96	3-Dec-96	4-Dec-96	4-Dec-96	5-Dec-96	5-Dec-96
Sample depth (feet bls)							0-1	0-1	0-1	0-1	0-1	0-1
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		16	180			2.5	4.5
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	22	210	3	3.5	4	5.5
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n		7.5				
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	70	140		4.5	5.5	14
Anthracene		19,000,000	23,000,000	n	610,000,000	n	130	140	6.5	9	8	48
Benzo(a)anthracene		1,400	880	c	7,800	c	110	170	2.5	4	8.5	65
Benzo(a)pyrene		100	88	c	780	c	**220**	**300**		5	12	**100**
Benzo(b)fluoranthene		1,400	880	c	7,800	c	75	120		4	5.5	32
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	38	38				14
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	75	120		4	5.5	32
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	140	180	2.5	4.5	8.5	75
Dibenz(a,h)anthracene		100	88	c	780	c	10	12				3
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	140	140	2.5	8	12	100
Fluorene		2,100,000	3,100,000	n	82,000,000	n	3.5	8	2.5		2.5	5.5
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	40	42			3.5	19
Naphthalene		1,000,000	3,100,000	n	82,000,000	n	14	100	3	3.5	4	6
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	55	180	7	13	16	60
Pyrene		2,200,000	2,300,000	n	61,000,000	n	180	180	3.5	8	12	100
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S03901	39S04301	39S05101	39S05501	39S05901	39S06001
Sampling Date								2-Dec-96	3-Dec-96	4-Dec-96	4-Dec-96	5-Dec-96	5-Dec-96
Sample depth (feet bls)								0-1	0-1	0-1	0-1	0-1	0-1
Dieldrin		70		40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000		490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg													
Aluminum	2088	72,000		78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8		0.43 /23	c/n	3.8 /610	c/n	NA	NA	NA	NA	NA	NA
Barium	8.7	105		5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0		0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75		39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND		1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290		390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700		4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105		3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000		23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500		400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND		460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600		1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7		23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105		1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390		390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390		390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND		1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND		6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15		550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000		23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g													
Gross Alpha	ND	ND		ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND		ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND		ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND		ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg													
Total Petroleum Hydrocarbons	ND	350		ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S06202	39B06201	39S06301	39S06302	39B06301	39S06401
Sampling Date							9/23/97	9/23/97	9/23/97	9/23/97	9/23/97	9/24/97
Sample depth (feet bls)							0.5-1.0	1-2	0-0.5	0.5-1.0	1-2	0-0.5
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		510		1500	4900	930	
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	1400		2000	5500	1400	540
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n			1800	5000	1100	
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	780			1400		490
Anthracene		19,000,000	23,000,000	n	610,000,000	n			28	89		
Benzo(a)anthracene		1,400	880	c	7,800	c	69		550	**1600**	400	67
Benzo(a)pyrene		100	88	c	780	c	97		**1200**	**2800**	**880**	**160**
Benzo(b)fluoranthene		1,400	880	c	7,800	c	170		1300	**3000**	940	210
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n			1000	2600	820	340
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	47		650	1500	460	45
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	210		1500	3400	1100	190
Dibenz(a,h)anthracene		100	88	c	780	c	**260**					
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n			3000	9000	2100	450
Fluorene		2,100,000	3,100,000	n	82,000,000	n				60		
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c			850	**1900**	640	120
Naphthalene		1,000,000	3,100,000	n	82,000,000	n	550					
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	230		500	1300	340	60
Pyrene		2,200,000	2,300,000	n	61,000,000	n		250	2000	5100	1800	930
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110 000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8 600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results
Study Area 39
Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S06202	39B06201	39S06301	39S06302	39B06301	39S06401
Sampling Date							9/23/97	9/23/97	9/23/97	9/23/97	9/23/97	9/24/97
Sample depth (feet bls)							0.5-1.0	1-2	0-0.5	0.5-1.0	1-2	0-0.5
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n	NA	NA	NA	NA	NA	1.4
Barium	8.7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1 Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening	SCTL for Residential Soil[1]	RBC for Residential Soil		RBC for Industrial Soil		39S06401D	39S06402	39S06402D	39B06401	39B06401D	39S06501
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	0.5-1.0	1-2	1-2	0-0.5
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		280			390		
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	570			820		480
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	220					
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n						
Anthracene		19,000,000	23,000,000	n	610,000,000	n						
Benzo(a)anthracene		1,400	880	c	7,800	c	130	23	52	380		
Benzo(a)pyrene		100	88	c	780	c	**260**		**160**	**960**		
Benzo(b)fluoranthene		1,400	880	c	7,800	c	310	82	140	860		
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	260		210	830		
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	100	120	40	430	65	
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	300	69	140	810	44	
Dibenz(a,h)anthracene		100	88	c	780	c						
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	490	110	140	1100		
Fluorene		2,100,000	3,100,000	n	82,000,000	n						
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	190		110	500		
Naphthalene		1,000,000	3,100,000	n	82,000,000	n						
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	110		24	150		
Pyrene		2,200,000	2,300,000	n	61,000,000	n	300			1000		360
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

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Appendix E

Table E-1 Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S06401D	39S06402	39S06402D	39B06401	39B06401D	39S06501
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	0.5-1.0	1-2	1-2	0-0.5
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n	1.2	1.2	0.9	0.98	0.61	1.8
Barium	8.7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S06501D	39S06502	39S06502D	39B06501	39S06601	39S06602
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	0.5-1.0	1-2	0-0.5	0.5-1.0
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		470				200	1900
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	1000	1400	460		510	4600
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	630	540	300			510
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	590				540	3100
Anthracene		19,000,000	23,000,000	n	610,000,000	n	37					720
Benzo(a)anthracene		1,400	880	c	7,800	c	200	390	210		97	100
Benzo(a)pyrene		100	88	c	780	c	210	1500	700		170	98
Benzo(b)fluoranthene		1,400	880	c	7,800	c	220	1300	700		200	120
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	310	1600	920		310	180
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	100	780	340		70	95
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c		1100	600		190	400
Dibenz(a,h)anthracene		100	88	c	780	c						
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	710	1200	430			
Fluorene		2,100,000	3,100,000	n	82,000,000	n	41					64
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	140	930	530		160	52
Naphthalene		1,000,000	3,100,000	n	82,000,000	n						2300
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	220	130	68		78	
Pyrene		2,200,000	2,300,000	n	61,000,000	n	380	940	460		350	
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39S06501D	39S06502	39S06502D	39B06501	39S06601	39S06602
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	0.5-1.0	1-2	0-0.5	0.5-1.0
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n		1.2		2	NA	NA
Barium	8.7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2] SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B06601	39S06701	39S06702	39B06703	39S06801	39S06802
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		760	480				700
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	2000	780			330	1000
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	410	500				1000
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	1500					
Anthracene		19,000,000	23,000,000	n	610,000,000	n						45
Benzo(a)anthracene		1,400	880	c	7,800	c	150	220	32	33	78	280
Benzo(a)pyrene		100	88	c	780	c	230	480	140	180	140	680
Benzo(b)fluoranthene		1,400	880	c	7,800	c	300	530	110	190	160	650
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	380	500		350		420
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	130	260	29	88	68	330
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	420	540		140	160	650
Dibenz(a,h)anthracene		100	88	c	780	c						
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	920	930	220	130	490	2000
Fluorene		2,100,000	3,100,000	n	82,000,000	n						58
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	190	400	91	160	100	400
Naphthalene		1,000,000	3,100,000	n	82,000,000	n						
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	300	150	20	34	58	310
Pyrene		2,200,000	2,300,000	n	61,000,000	n	340	680	290	220	360	960
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E
Table E-1. Summary of Detections in Surface Soil Analytical Results
Study Area 39
Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B06601	39S06701	39S06702	39B06703	39S06801	39S06802
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0 8	0.43 /23	c/n	3.8 /610	c/n	NA		NA	NA	NA	NA
Barium	8 7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0 09	120 0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4 6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4 1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3 1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B06803	39S06901	39S06902	39B06901	39S07001	39S07002
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		380	460	240	650	NA	NA
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	670	1100	460	3400	NA	NA
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	600	540	190	1800	NA	NA
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n				610	NA	NA
Anthracene		19,000,000	23,000,000	n	610,000,000	n				31	NA	NA
Benzo(a)anthracene		1,400	880	c	7,800	c	190	90	54	1100	NA	NA
Benzo(a)pyrene		100	88	c	780	c	**410**	**190**	**150**	**1600**	NA	NA
Benzo(b)fluoranthene		1,400	880	c	7,800	c	460	230	160	**3700**	NA	NA
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	400	370	120	2700	NA	NA
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	220	94	72	3700	NA	NA
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	400	270	170	2500	NA	NA
Dibenz(a,h)anthracene		100	88	c	780	c	**690**				NA	NA
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	950	630		3600	NA	NA
Fluorene		2,100,000	3,100,000	n	82,000,000	n		49		79	NA	NA
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	310	140	84	**2300**	NA	NA
Naphthalene		1,000,000	3,100,000	n	82,000,000	n					NA	NA
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	140	200	67	780	NA	NA
Pyrene		2,200,000	2,300,000	n	61,000,000	n	520		200	1900	NA	NA
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B06803	39S06901	39S06902	39B06901	39S07001	39S07002
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72 000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0 8	0 43 /23	c/n	3.8 /610	c/n	NA	NA	NA	NA	0.63	0.83
Barium	8 7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0 09	120 0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4 6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4 1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14 5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8 1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0 07	3 7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4 4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1 8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17 2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1. Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B07001	39S07101	39S07102	39S07201	39S07202	39B07201
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	0-0.5	0.5-1.0	1-2
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND		NA	NA	NA	340	380	250
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	NA	NA	NA	230	670	530
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n	NA	NA	NA			230
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n	NA	NA	NA			
Anthracene		19,000,000	23,000,000	n	610,000,000	n	NA	NA	NA			
Benzo(a)anthracene		1,400	880	c	7,800	c	NA	NA	NA	34	23	100
Benzo(a)pyrene		100	88	c	780	c	NA	NA	NA		240	190
Benzo(b)fluoranthene		1,400	880	c	7,800	c	NA	NA	NA		58	220
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	NA	NA	NA			260
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	NA	NA	NA		240	71
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	NA	NA	NA	63	93	210
Dibenz(a,h)anthracene		100	88	c	780	c	NA	NA	NA			
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	NA	NA	NA			310
Fluorene		2,100,000	3,100,000	n	82,000,000	n	NA	NA	NA			
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	NA	NA	NA			140
Naphthalene		1,000,000	3,100,000	n	82,000,000	n	NA	NA	NA			
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	NA	NA	NA	44	85	69
Pyrene		2,200,000	2,300,000	n	61,000,000	n	NA	NA	NA	150	160	130
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

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Appendix E
Table E-1. Summary of Detections in Surface Soil Analytical Results
Study Area 39
Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	[2]SCTL for Residential Soil	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B07001	39S07101	39S07102	39S07201	39S07202	39B07201
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							1-2	0-0.5	0.5-1.0	0-0.5	0.5-1.0	1-2
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0.8	0.43 /23	c/n	3.8 /610	c/n	0.75	1.1	0.94	1.6	1.7	0.97
Barium	8.7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120.0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4.1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14.5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8.1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0.07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4.4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0.95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1.8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91.4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E

Table E-1 Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening	SCTL for Residential Soil	RBC for Residential Soil		RBC for Industrial Soil		39S07301	39S07302	39B07301	39S07401	39S07402	39B07401
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0	1-2
Volatile organics, ug/kg												
Carbon disulfide		200,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Ethylbenzene		240,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Methylene chloride		16,000	85,000	c	760,000	n	NA	NA	NA	NA	NA	NA
Tetrachloroethene		10,000	12,000	c	110,000	c	NA	NA	NA	NA	NA	NA
Toluene		300,000	16,000,000	n	410,000,000	n	NA	NA	NA	NA	NA	NA
Xylene (total)		290,000	160,000,000	n	1,000,000,000	n	NA	NA	NA	NA	NA	NA
Semivolatile organics, ug/kg												
1-Methylnaphthalene		290,000	ND		ND			440	620	NA	NA	NA
2-Methylnaphthalene		1,500,000	3,100,000	n	82,000,000	n	910	910	1600	NA	NA	NA
Acenaphthene		2,300,000	4,700,000	n	120,000,000	n		920	240	NA	NA	NA
Acenaphthylene		1,100,000	2,300,000	n	61,000,000	n			1400	NA	NA	NA
Anthracene		19,000,000	23,000,000	n	610,000,000	n		63		NA	NA	NA
Benzo(a)anthracene		1,400	880	c	7,800	c	120	200	100	NA	NA	NA
Benzo(a)pyrene		100	88	c	780	c	320	630	160	NA	NA	NA
Benzo(b)fluoranthene		1,400	880	c	7,800	c	310	520	210	NA	NA	NA
Benzo(g,h,i)perylene		2,300,000	2,300,000	n	61,000,000	n	440	470	350	NA	NA	NA
Benzo(k)fluoranthene		15,000	8,800	c	78,000	c	99	170	280	NA	NA	NA
Carbazole		53,000	32,000	c	290,000	c						
Chrysene		140,000	88,000	c	780,000	c	370	420	260	NA	NA	NA
Dibenz(a,h)anthracene		100	88	c	780	c	360			NA	NA	NA
Dibenzofuran		270,000	310,000	n	8,200,000	n						
Fluoranthene		2,800,000	3,100,000	n	82,000,000	n	770	850	660	NA	NA	NA
Fluorene		2,100,000	3,100,000	n	82,000,000	n		46		NA	NA	NA
Indeno(1,2,3-cd)pyrene		1,500	880	c	7,800	c	230	360	340	NA	NA	NA
Naphthalene		1,000,000	3,100,000	n	82,000,000	n				NA	NA	NA
Phenanthrene		1,900,000	2,300,000	n	61,000,000	n	99	340	300	NA	NA	NA
Pyrene		2,200,000	2,300,000	n	61,000,000	n	580	580		NA	NA	NA
bis(2-Ethylhexyl)phthalate		75,000	46,000	c	410,000	c	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate		110,000	7,800,000	n	200,000,000	n	NA	NA	NA	NA	NA	NA
Pentachlorophenol		8,600	5300	c	43000	c	NA	NA	NA	NA	NA	NA
Explosives, ug/g												
2,4-Dinitrotoluene		1,300	160,000	n	4,100,000	n	NA	NA	NA	NA	NA	NA
Pesticides/PCBs, ug/kg												
4,4'-DDE		3,200	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
4,4'-DDT		4,500	1900	c	17,000	c	NA	NA	NA	NA	NA	NA
alpha-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA

Appendix E

Table E-1 Summary of Detections in Surface Soil Analytical Results

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Identifier	Background Screening [1]	SCTL for Residential Soil	RBC for Residential Soil		RBC for Industrial Soil		39S07301	39S07302	39B07301	39S07401	39S07402	39B07401
Sampling Date							9/24/97	9/24/97	9/24/97	9/24/97	9/24/97	9/24/97
Sample depth (feet bls)							0-0.5	0.5-1.0	1-2	0-0.5	0.5-1.0	1-2
Dieldrin		70	40	c	360	c	NA	NA	NA	NA	NA	NA
gamma-Chlordane		3,000	490	c	4400	c	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg												
Aluminum	2088	72,000	78,000	n	1,000,000	n	NA	NA	NA	NA	NA	NA
Arsenic	1	0 8	0.43 /23	c/n	3.8 /610	c/n		**1.2**	**1.6**	**1.2**	**3.8**	**2.3**
Barium	8 7	105	5,500	n	140,000	n	NA	NA	NA	NA	NA	NA
Beryllium	0.09	120 0	0.15	c	1.3	c	NA	NA	NA	NA	NA	NA
Cadmium		75	39	n	1000	n	NA	NA	NA	NA	NA	NA
Calcium	25295	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Chromium	4.6	290	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Cobalt		4,700	4,700	n	120,000	n	NA	NA	NA	NA	NA	NA
Copper	4 1	105	3,100	n	82,000	n	NA	NA	NA	NA	NA	NA
Iron	712	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Lead	14 5	500	400		400		NA	NA	NA	NA	NA	NA
Magnesium	328	ND	460,468		460,468		NA	NA	NA	NA	NA	NA
Manganese	8 1	1,600	1800	n	47,000	n	NA	NA	NA	NA	NA	NA
Mercury	0 07	3.7	23	n	610	n	NA	NA	NA	NA	NA	NA
Nickel	4 4	105	1,600	n	41,000	n	NA	NA	NA	NA	NA	NA
Selenium	0 95	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Silver	1 8	390	390	n	10,000	n	NA	NA	NA	NA	NA	NA
Sodium	91 4	ND	1,000,000		1,000,000		NA	NA	NA	NA	NA	NA
Thallium	2	ND	6.3	n	160	n	NA	NA	NA	NA	NA	NA
Vanadium	3.1	15	550	n	14,000	n	NA	NA	NA	NA	NA	NA
Zinc	17.2	23,000	23,000	n	610,000	n	NA	NA	NA	NA	NA	NA
Radiological, pCi/g												
Gross Alpha	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Alpha, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
Gross Beta, Uncertainty	ND	ND	ND		ND		NA	NA	NA	NA	NA	NA
General Chemistry, mg/kg												
Total Petroleum Hydrocarbons	ND	350	ND		ND		NA	NA	NA	NA	NA	NA

Appendix E.

Table E-1. Summary of Positive Detections in Surface Soil Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

NOTES:

[1] The background screening value is twice the average of detected concentrations for inorganic analytes.

[2] SCTL = Florida Department of Environmental Protection, Soil Cleanup Target Levels, Chapter 62-785 FAC, April 30, 1998. Chromium values are for Chromium VI.

[3] RBC = Risk-Based Concentration Table, USEPA Region III, March 1997, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER directive 9355-4-12). For essential nutrients (calcium, magnesium, potassium and sodium) screening values were derived based on recommended daily allowances (RDAs). RBC for phenanthrene is not available, value is based on pyrene. RBC for alpha-Chlordane and gamma-Chlordane is based on Chlordane.

n = noncarcinogenic pathway
c = carcinogenic pathway
NA = Not analyzed
ND = Not determined
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethene
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
ug/g = microgram per gram
PCB = polychlorinated biphenyl
OSWER = Office of Solid Waste and Emergency Response
USEPA = U.S. Environmental Protection Agency
B = Reported concentration is between the instrument detection limit (IDL) and Contract Required Detection Limit (CRDL).
J = Reported concentration is an estimated quantity
All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight; organics in micrograms per kilogram (ug/kg) soil dry weight.
Bold/shaded values indicate exceedance of regulatory guidance and background.
Blank space indicates analyte compound was not detected at the reporting limit.

TABLE E-2

SUMMARY OF DETECTIONS IN SUBSURFACE SOIL ANALYTICAL RESULTS (CLP LABORATORY)

Appendix E.

Table E-2. Summary of Positive Detections in Subsurface Soil Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	SCTL [2] Leaching	RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B00102		39B00202		39B00302		39B00302D		39B00402		39B00502	
Sampling Date							19-Mar-96		19-Mar-96		20-Mar-96		20-Mar-96		20-Mar-96		20-Mar-96	
Volatile organics, ug/kg																		
Ethylbenzene		NA	7,800,000	n	200,000,000	n			1	J								
Toluene		NA	16,000,000	n	410,000,000	n					2	J			15			
Xylene (total)		NA	160,000,000	n	1,000,000,000	n			6	J					1	J		
Semivolatile organics, ug/kg																		
bis(2-Ethylhexyl)phthalate		NA	46,000	c	410,000	c	79	J										
Pentachlorophenol		NA	5300	c	43000	c											55	J
Pesticides/PCBs, ug/kg																		
4,4'-DDT		NA	1900	c	17,000	c			3	J								
Inorganics, mg/kg																		
Aluminum	2088	NA	78,000	n	1,000,000	n	6.5	BJ	641	J	185	J	264	J	1830	J	7.9	BJ
Arsenic	1	NA	0.43 /23	c/n	3.8 /610	c/n											0.5	BJ
Barium	8.7	NA	5,500	n	140,000	n	0.17	BJ	4.6	BJ	0.32	BJ	0.44	BJ	0.58	BJ		
Calcium	25295	NA	1,000,000		1,000,000		163	B	1430		256	B	397	B	415	B	72.8	B
Chromium	4.6	NA	390	n	10,000	n	1.2	B	2.6		1.5	B	2.1	B	3			
Copper	4.1	NA	3,100	n	82,000	n			0.92	B	0.85	B	1	B	1.1	B	0.51	B
Iron	712	NA	23,000	n	610,000	n	87.5		213		136		124		103		202	
Lead	14.5	NA	400		400				19.5		0.59	B	1.5		1.5			
Magnesium	328	NA	460,468		460,468				11.1	B			8.6	B	31.2	B		
Manganese	8.1	NA	1800	n	47,000	n	0.96	B	1.4	B	0.95	B	0.91	B	0.59	B	0.65	B
Mercury	0.07	NA	23	n	610	n	0.04	B									0.04	B
Vanadium	3.1	NA	550	n	14,000	n			0.67	B								
Zinc	17.2	NA	23,000	n	610,000	n	2.8	B	1.9	B	1.2	B	2.6	B	1.4	B	1.1	B
Radiological, pCi/g																		
Gross Alpha	ND	NA	ND		ND		NA		NA		NA		NA		NA		NA	
Gross Alpha, Uncertainty	ND	NA	ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta	ND	NA	ND		ND		NA		NA		NA		NA		NA		NA	
Gross Beta, Uncertainty	ND	NA	ND		ND		NA		NA		NA		NA		NA		NA	

Appendix E.

Table E-2. Summary of Positive Detections in Subsurface Soil Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Identifier	Background Screening [1]	SCTL [2] Leaching		RBC [3] for Residential Soil		RBC [3] for Industrial Soil		39B00901		39B01001		39B01101		39S00901	
Sampling Date								29-Aug-96		29-Aug-96		29-Aug-96		29-Aug-96	
Volatile organics, ug/kg															
Ethylbenzene		NA		7,800,000	n	200,000,000	n	NA		NA		NA		NA	
Toluene		NA		16,000,000	n	410,000,000	n	NA		NA		NA		NA	
Xylene (total)		NA		160,000,000	n	1,000,000,000	n	NA		NA		NA		NA	
Semivolatile organics, ug/kg															
bis(2-Ethylhexyl)phthalate		NA		46,000	c	410,000	c	NA		NA		NA		NA	
Pentachlorophenol		NA		5300	c	43000	c	NA		NA		NA		NA	
Pesticides/PCBs, ug/kg															
4,4'-DDT		NA		1900	c	17,000	c	NA		NA		NA		NA	
Inorganics, mg/kg															
Aluminum	2088	NA		78,000	n	1,000,000	n	NA		NA		NA		NA	
Arsenic	1	NA		0.43 /23	c/n	3.8 /610	c/n	NA		NA		NA		NA	
Barium	8.7	NA		5,500	n	140,000	n	NA		NA		NA		NA	
Calcium	25295	NA		1,000,000		1,000,000		NA		NA		NA		NA	
Chromium	4.6	NA		390	n	10,000	n	NA		NA		NA		NA	
Copper	4.1	NA		3,100	n	82,000	n	NA		NA		NA		NA	
Iron	712	NA		23,000	n	610,000	n	NA		NA		NA		NA	
Lead	14.5	NA		400		400		NA		NA		NA		NA	
Magnesium	328	NA		460,468		460,468		NA		NA		NA		NA	
Manganese	8.1	NA		1800	n	47,000	n	NA		NA		NA		NA	
Mercury	0.07	NA		23	n	610	n	NA		NA		NA		NA	
Vanadium	3.1	NA		550	n	14,000	n	NA		NA		NA		NA	
Zinc	17.2	NA		23,000	n	610,000	n	NA		NA		NA		NA	
Radiological, pCi/g															
Gross Alpha	ND	NA		ND		ND		0.04		0.09		0.6		0.13	
Gross Alpha, Uncertainty	ND	NA		ND		ND		0.05		0.06		0.11		0.07	
Gross Beta	ND	NA		ND		ND		0.1		0.03		0.68		0.27	
Gross Beta, Uncertainty	ND	NA		ND		ND		0.09		0.09		0.13		0.1	

Appendix E.

Table E-2. Summary of Positive Detections in Subsurface Soil Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

NOTES:

[1] The background screening value is twice the average of detected concentrations for inorganic analytes.
[2] SCTL = Florida Department of Environmental Protection, Soil Cleanup Target Levels, Chapter 62-785 FAC, April 30, 1998.
For detected analytes and compounds in subsurface soils, SCTLs are not applicable (NAs) because they are not associated exceedances of Florida groundwater guidance concentrations in site groundwater.
[3] RBC = Risk-Based Concentration Table, USEPA Region III, March 1997, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER directive 9355-4-12). For essential nutrients (calcium, magnesium) screening values were derived based on recommended daily allowances (RDAs).

n = noncarcinogenic pathway
c = carcinogenic pathway
NA = Not applicable (for SCTLs) or not analyzed.
ND = Not determined.
DDT = Dichlorodiphenyltrichloroethene
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
pCi/g = picocuries per gram
PCB = polychlorinated biphenyl
OSWER = Office of Solid Waste and Emergency Response
USEPA = U.S. Environmental Protection Agency
B = Reported concentration is between the instrument detection limit (IDL) and Contract Required Detection Limit (CRDL).
J = Reported concentration is an estimated quantity
All inorganics results expressed in milligrams per kilogram (mg/kg) soil dry weight; organics in micrograms per kilogram (ug/kg) soil dry weight.
Bold shaded values indicate exceedance of regulatory guidance and background.
Blank space indicates analyte/compound was not detected at the reporting limit.

TABLE E-3

SUMMARY OF DETECTIONS IN GROUNDWATER ANALYTICAL RESULTS (CLP LABORATORY)

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]		FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39G00101		39G00201		39G00201D		39G00202		39G00202D		39G00301		39G00301D		39G00302	
Sampling Date								4/2/96		4/2/96		4/2/96		8/29/96		8/29/96		4/3/96		4/3/96		11/27/96	
Volatile organics, ug/L																							
1,2,4-Trimethylbenzene			10	o	ND	300	n							NA		NA							
1,3,5-Trimethylbenzene			10	o	ND	300	n							NA		NA							
Benzene			1	p/c	5	0.36	c							NA		NA							
Carbon disulfide			700	st	ND	1000	n			2		2		NA		NA		1		1			
Carbon tetrachloride			3	p/c	5	0.16	c							NA		NA							
Chloroform			5 7	c	100	0.15	c							NA		NA							
Chloromethane			2 7	c	ND	1.4	c							NA		NA				0.3	J		
Hexachlorobutadiene			0 5	c	ND	0.14	c							NA		NA							
Styrene			100	p	100	1600	n			3		3		NA		NA							
Tetrachloroethene			3	p	5	1.1	c							NA		NA		8		10		16	
Toluene			40	s	1000	750	n							NA		NA							
Trichloroethene			3	p/c	5	1.6	c							NA		NA							
Trichlorofluoromethane			2100	st	ND	1300	n							NA		NA							
Semivolatile organics, ug/L																							
Di-n-butylphthalate			700	st	ND	3700	n							NA		NA						NA	
Explosives, ug/L																							
2,4,6-Trinitrotoluene			10	c	ND	2.2	c							NA		NA		0.07				NA	
Inorganics, ug/L																							
Aluminum	4067		200	s	ND	37,000	n	1750	J	1550	J	1550	J	NA		NA		257	J	273	J	NA	
Antimony	4 1		6	p/st	6	15	n	1.6	B					NA		NA						NA	
Arsenic	5		50	p/c	50	0.045 /11	c/n			3.9	B	3	B	NA		NA						NA	
Barium	31 4		2,000	p/st	2,000	2,600	n					53.8	J	NA		NA						NA	
Calcium	36830		ND		ND	1,000,000		30800		132000		135000		NA		NA		50600		50700		NA	
Cobalt	ND		420	st	ND	2200	n			22.2	B	21.7	B	NA		NA						NA	
Copper	5 4		1000	s/st	ND	1,500	n	3.8	J					NA		NA						NA	
Iron	1227		300	s	ND	11,000	n			1320	J	1220	J	NA		NA						NA	
Magnesium	4560		ND		ND	118,807		1200	B	819	B	838	B	NA		NA		2170	B	2170	B	NA	
Manganese	17		50	s/st	ND	840	n			13.3	J	13.5	J	NA		NA						NA	
Mercury	0.12		2	st	2	11	n	0.24	J					NA		NA						NA	
Nickel	ND		100	p/st	100	730	n			12.5	B	12.2	B	NA		NA						NA	
Potassium	5400		ND		ND	297,016		998	B	2470	B	2000	B	NA		NA		7080		7340		NA	
Selenium	9.7		50	p/st	50	180	n							NA		NA						NA	
Sodium	18222		160,000	p	ND	396,022		1040	J	5960	J	6020	J	NA		NA		4300	BJ	4310	BJ	NA	
Vanadium	20.6		49	mc/st	ND	260	n	5	B	1.9	B			NA		NA		5.3	B	5.4	B	NA	
Zinc	4		5000	s/st	ND	11,000	n			85.5	J	88.1	J	NA		NA						NA	

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39G00302		39G00303		39G00401		39G00501		39G00701		39G00702		39G00801		39G00901	
Sampling Date							11/27/96		5/16/97		4/3/96		4/3/96		11/27/96		5/15/97		11/26/96		11/26/96	
Volatile organics, ug/L																						
1,2,4-Trimethylbenzene		10	o	ND	300	n																
1,3,5-Trimethylbenzene		10	o	ND	300	n																
Benzene		1	p/c	5	0.36	c																
Carbon disulfide		700	st	ND	1000	n					3		0.3	J								
Carbon tetrachloride		3	p/c	5	0.16	c																
Chloroform		5 7	c	100	0.15	c																
Chloromethane		2 7	c	ND	1.4	c																
Hexachlorobutadiene		0 5	c	ND	0.14	c																
Styrene		100	p	100	1600	n																
Tetrachloroethene		3	p	5	1.1	c	14		8.6						12		11		22		36	
Toluene		40	s	1000	750	n																
Trichloroethene		3	p/c	5	1.6	c											0.23	J	2			
Trichlorofluoromethane		2100	st	ND	1300	n																
Semivolatile organics, ug/L																						
Di-n-butylphthalate		700	st	ND	3700	n	NA		NA		1	J			NA		NA		NA		NA	
Explosives, ug/L																						
2,4,6-Trinitrotoluene		10	c	ND	2 2	c	NA		NA						NA		NA		NA		NA	
Inorganics, ug/L																						
Aluminum	4067	200	s	ND	37,000	n	NA		NA		1160	J	365	J	NA		NA		NA		NA	
Antimony	4 1	6	p/st	6	15	n	NA		NA						NA		NA		NA		NA	
Arsenic	5	50	p/c	50	0.045 /11	c/n	NA		NA						NA		NA		NA		NA	
Barium	31 4	2,000	p/st	2,000	2,600	n	NA		NA						NA		NA		NA		NA	
Calcium	36830	ND		ND	1,000,000		NA		NA		13200		50400		NA		NA		NA		NA	
Cobalt	ND	420	st	ND	2200	n	NA		NA						NA		NA		NA		NA	
Copper	5 4	1000	s/st	ND	1,500	n	NA		NA				2.3	J	NA		NA		NA		NA	
Iron	1227	300	s	ND	11,000	n	NA		NA				269	J	NA		NA		NA		NA	
Magnesium	4560	ND		ND	118,807		NA		NA		1190	B	2040	B	NA		NA		NA		NA	
Manganese	17	50	s/st	ND	840	n	NA		NA						NA		NA		NA		NA	
Mercury	0.12	2	st	2	11	n	NA		NA		0.17	J			NA		NA		NA		NA	
Nickel	ND	100	p/st	100	730	n	NA		NA						NA		NA		NA		NA	
Potassium	5400	ND		ND	297,016		NA		NA		3070	B	3850	B	NA		NA		NA		NA	
Selenium	9.7	50	p/st	50	180	n	NA		NA				1.4	B	NA		NA		NA		NA	
Sodium	18222	160,000	p	ND	396,022		NA		NA		2310	J	4230	J	NA		NA		NA		NA	
Vanadium	20.6	49	mc/st	ND	260	n	NA		NA		7	B	2.4	B	NA		NA		NA		NA	
Zinc	4	5000	s/st	ND	11,000	n	NA		NA						NA		NA		NA		NA	

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39G01001		39G01101		39G01401		39G01501		39G01601		39G01701		39G01701D	
Sampling Date							11/26/96		11/26/96		5/14/97		5/22/97		5/22/97		5/21/97		5/21/97	
Volatile organics, ug/L																				
1,2,4-Trimethylbenzene		10	o	ND	300	n														
1,3,5-Trimethylbenzene		10	o	ND	300	n														
Benzene		1	p/c	5	0.36	c														
Carbon disulfide		700	st	ND	1000	n														
Carbon tetrachloride		3	p/c	5	0.16	c														
Chloroform		5.7	c	100	0.15	c					0.1	J	0.28	J	0.22	J				
Chloromethane		2.7	c	ND	1.4	c														
Hexachlorobutadiene		0.5	c	ND	0.14	c														
Styrene		100	p	100	1600	n														
Tetrachloroethene		3	p	5	1.1	c	3		2				1.6		12		0.78		0.89	
Toluene		40	s	1000	750	n			1											
Trichloroethene		3	p/c	5	1.6	c							0.21	J	0.65					
Trichlorofluoromethane		2100	st	ND	1300	n														
Semivolatile organics, ug/L																				
Di-n-butylphthalate		700	st	ND	3700	n	NA		NA		NA		NA		NA		NA		NA	
Explosives, ug/L																				
2,4,6-Trinitrotoluene		10	c	ND	2.2	c	NA		NA		NA		NA		NA		NA		NA	
Inorganics, ug/L																				
Aluminum	4067	200	s	ND	37,000	n	NA		NA		NA		NA		NA		NA		NA	
Antimony	4.1	6	p/st	6	15	n	NA		NA		NA		NA		NA		NA		NA	
Arsenic	5	50	p/c	50	0.045 / 11	c/n	NA		NA		NA		NA		NA		NA		NA	
Barium	31.4	2,000	p/st	2,000	2,600	n	NA		NA		NA		NA		NA		NA		NA	
Calcium	36830	ND		ND	1,000,000		NA		NA		NA		NA		NA		NA		NA	
Cobalt	ND	420	st	ND	2200	n	NA		NA		NA		NA		NA		NA		NA	
Copper	5.4	1000	s/st	ND	1,500	n	NA		NA		NA		NA		NA		NA		NA	
Iron	1227	300	s	ND	11,000	n	NA		NA		NA		NA		NA		NA		NA	
Magnesium	4560	ND		ND	118,807		NA		NA		NA		NA		NA		NA		NA	
Manganese	17	50	s/st	ND	840	n	NA		NA		NA		NA		NA		NA		NA	
Mercury	0.12	2	st	2	11	n	NA		NA		NA		NA		NA		NA		NA	
Nickel	ND	100	p/st	100	730	n	NA		NA		NA		NA		NA		NA		NA	
Potassium	5400	ND		ND	297,016		NA		NA		NA		NA		NA		NA		NA	
Selenium	9.7	50	p/st	50	180	n	NA		NA		NA		NA		NA		NA		NA	
Sodium	18222	160,000	p	ND	396,022		NA		NA		NA		NA		NA		NA		NA	
Vanadium	20.6	49	mc/st	ND	260	n	NA		NA		NA		NA		NA		NA		NA	
Zinc	4	5000	s/st	ND	11,000	n	NA		NA		NA		NA		NA		NA		NA	

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39G01801	39G01901	39G02101	39G02201	39G02201D	39G02501	39G02601
Sampling Date							5/21/97	5/22/97	5/19/97	5/19/97	5/19/97	5/15/97	5/15/97
Volatile organics, ug/L													
1,2,4-Trimethylbenzene		10	o	ND	300	n		1/1/00					
1,3,5-Trimethylbenzene		10	o	ND	300	n		1.9					
Benzene		1	p/c	5	0.36	c							
Carbon disulfide		700	st	ND	1000	n							
Carbon tetrachloride		3	p/c	5	0.16	c							
Chloroform		5 7	c	100	0.15	c		0.38 J			0.11 J	0.2 J	0.65
Chloromethane		2 7	c	ND	1.4	c							
Hexachlorobutadiene		0 5	c	ND	0.14	c							
Styrene		100	p	100	1600	n							
Tetrachloroethene		3	p	5	1.1	c	9.3	27	1.3	0.44 J	0.46 J		
Toluene		40	s	1000	750	n							
Trichloroethene		3	p/c	5	1.6	c	0.47 J	0.64					
Trichlorofluoromethane		2100	st	ND	1300	n		3					
Semivolatile organics, ug/L													
Di-n-butylphthalate		700	st	ND	3700	n	NA	NA	NA	NA	NA	NA	NA
Explosives, ug/L													
2,4,6-Trinitrotoluene		10	c	ND	2.2	c	NA	NA	NA	NA	NA	NA	NA
Inorganics, ug/L													
Aluminum	4067	200	s	ND	37,000	n	NA	NA	NA	NA	NA	NA	NA
Antimony	4 1	6	p/st	6	15	n	NA	NA	NA	NA	NA	NA	NA
Arsenic	5	50	p/c	50	0.045 /11	c/n	NA	NA	NA	NA	NA	NA	NA
Barium	31.4	2,000	p/st	2,000	2,600	n	NA	NA	NA	NA	NA	NA	NA
Calcium	36830	ND		ND	1,000,000		NA	NA	NA	NA	NA	NA	NA
Cobalt	ND	420	st	ND	2200	n	NA	NA	NA	NA	NA	NA	NA
Copper	5.4	1000	s/st	ND	1,500	n	NA	NA	NA	NA	NA	NA	NA
Iron	1227	300	s	ND	11,000	n	NA	NA	NA	NA	NA	NA	NA
Magnesium	4560	ND		ND	118,807		NA	NA	NA	NA	NA	NA	NA
Manganese	17	50	s/st	ND	840	n	NA	NA	NA	NA	NA	NA	NA
Mercury	0 12	2	st	2	11	n	NA	NA	NA	NA	NA	NA	NA
Nickel	ND	100	p/st	100	730	n	NA	NA	NA	NA	NA	NA	NA
Potassium	5400	ND		ND	297,016		NA	NA	NA	NA	NA	NA	NA
Selenium	9 7	50	p/st	50	180	n	NA	NA	NA	NA	NA	NA	NA
Sodium	18222	160,000	p	ND	396,022		NA	NA	NA	NA	NA	NA	NA
Vanadium	20.6	49	mc/st	ND	260	n	NA	NA	NA	NA	NA	NA	NA
Zinc	4	5000	s/st	ND	11,000	n	NA	NA	NA	NA	NA	NA	NA

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39Q00104		39Q00108		39Q00203		39Q01203		39Q01203D		39Q01302		39Q01404	
Sampling Date							3/18/97		3/26/97		3/18/97		3/29/97		3/29/97		3/29/97		3/31/97	
Volatile organics, ug/L																				
1,2,4-Trimethylbenzene		10	o	ND	300	n														
1,3,5-Trimethylbenzene		10	o	ND	300	n														
Benzene		1	p/c	5	0.36	c											0.19	J	2.5	J
Carbon disulfide		700	st	ND	1000	n														
Carbon tetrachloride		3	p/c	5	0.16	c													2.2	J
Chloroform		5.7	c	100	0.15	c														
Chloromethane		2.7	c	ND	1.4	c														
Hexachlorobutadiene		0.5	c	ND	0.14	c	0.1	J												
Styrene		100	p	100	1600	n														
Tetrachloroethene		3	p	5	1.1	c	0.92		0.2	J	48		41		33		6.2		260	
Toluene		40	s	1000	750	n														
Trichloroethene		3	p/c	5	1.6	c					1.1	J	0.76	J	0.68	J	0.28	J	2.6	J
Trichlorofluoromethane		2100	st	ND	1300	n														
Semivolatile organics, ug/L																				
Di-n-butylphthalate		700	st	ND	3700	n	NA		NA		NA		NA		NA		NA		NA	
Explosives, ug/L																				
2,4,6-Trinitrotoluene		10	c	ND	2.2	c	NA		NA		NA		NA		NA		NA		NA	
Inorganics, ug/L																				
Aluminum	4067	200	s	ND	37,000	n	NA		NA		NA		NA		NA		NA		NA	
Antimony	4.1	6	p/st	6	15	n	NA		NA		NA		NA		NA		NA		NA	
Arsenic	5	50	p/c	50	0.045 /11	c/n	NA		NA		NA		NA		NA		NA		NA	
Barium	31.4	2,000	p/st	2,000	2,600	n	NA		NA		NA		NA		NA		NA		NA	
Calcium	36830	ND		ND	1,000,000		NA		NA		NA		NA		NA		NA		NA	
Cobalt	ND	420	st	ND	2200	n	NA		NA		NA		NA		NA		NA		NA	
Copper	5.4	1000	s/st	ND	1,500	n	NA		NA		NA		NA		NA		NA		NA	
Iron	1227	300	s	ND	11,000	n	NA		NA		NA		NA		NA		NA		NA	
Magnesium	4560	ND		ND	118,807		NA		NA		NA		NA		NA		NA		NA	
Manganese	17	50	s/st	ND	840	n	NA		NA		NA		NA		NA		NA		NA	
Mercury	0.12	2	st	2	11	n	NA		NA		NA		NA		NA		NA		NA	
Nickel	ND	100	p/st	100	730	n	NA		NA		NA		NA		NA		NA		NA	
Potassium	5400	ND		ND	297,016		NA		NA		NA		NA		NA		NA		NA	
Selenium	9.7	50	p/st	50	180	n	NA		NA		NA		NA		NA		NA		NA	
Sodium	18222	160,000	p	ND	396,022		NA		NA		NA		NA		NA		NA		NA	
Vanadium	20.6	49	mc/st	ND	260	n	NA		NA		NA		NA		NA		NA		NA	
Zinc	4	5000	s/st	ND	11,000	n	NA		NA		NA		NA		NA		NA		NA	

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPGCTL		Primary FEDMCL	RBC [2] for Tap Water		39Q01405	39Q01604	39Q02003	39Q02004	39Q02005	39Q02006
Sampling Date							3/31/97	3/31/97	4/1/97	4/2/97	4/2/97	4/2/97
Volatile organics, ug/L												
1,2,4-Trimethylbenzene		10	o	ND	300	n						
1,3,5-Trimethylbenzene		10	o	ND	300	n						
Benzene		1	p/c	5	0.36	c						1.6 J
Carbon disulfide		700	st	ND	1000	n						
Carbon tetrachloride		3	p/c	5	0.16	c						4.7 J
Chloroform		5.7	c	100	0.15	c						
Chloromethane		2.7	c	ND	1.4	c						
Hexachlorobutadiene		0.5	c	ND	0.14	c						
Styrene		100	p	100	1600	n						
Tetrachloroethene		3	p	5	1.1	c	2.2	14	6.4	11	1.6	260
Toluene		40	s	1000	750	n				0.63		4 J
Trichloroethene		3	p/c	5	1.6	c		0.17 J	0.1 J	0.18 J		4.4 J
Trichlorofluoromethane		2100	st	ND	1300	n						
Semivolatile organics, ug/L												
Di-n-butylphthalate		700	st	ND	3700	n	NA	NA	NA	NA	NA	NA
Explosives, ug/L												
2,4,6-Trinitrotoluene		10	c	ND	2.2	c	NA	NA	NA	NA	NA	NA
Inorganics, ug/L												
Aluminum	4067	200	s	ND	37,000	n	NA	NA	NA	NA	NA	NA
Antimony	4.1	6	p/st	6	15	n	NA	NA	NA	NA	NA	NA
Arsenic	5	50	p/c	50	0.045 / 11	c/n	NA	NA	NA	NA	NA	NA
Barium	31.4	2,000	p/st	2,000	2,600	n	NA	NA	NA	NA	NA	NA
Calcium	36830	ND		ND	1,000,000		NA	NA	NA	NA	NA	NA
Cobalt	ND	420	st	ND	2200	n	NA	NA	NA	NA	NA	NA
Copper	5.4	1000	s/st	ND	1,500	n	NA	NA	NA	NA	NA	NA
Iron	1227	300	s	ND	11,000	n	NA	NA	NA	NA	NA	NA
Magnesium	4560	ND		ND	118,807		NA	NA	NA	NA	NA	NA
Manganese	17	50	s/st	ND	840	n	NA	NA	NA	NA	NA	NA
Mercury	0.12	2	st	2	11	n	NA	NA	NA	NA	NA	NA
Nickel	ND	100	p/st	100	730	n	NA	NA	NA	NA	NA	NA
Potassium	5400	ND		ND	297,016		NA	NA	NA	NA	NA	NA
Selenium	9.7	50	p/st	50	180	n	NA	NA	NA	NA	NA	NA
Sodium	18222	160,000	p	ND	396,022		NA	NA	NA	NA	NA	NA
Vanadium	20.6	49	mc/st	ND	260	n	NA	NA	NA	NA	NA	NA
Zinc	4	5000	s/st	ND	11,000	n	NA	NA	NA	NA	NA	NA

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]	FDEPG	Primary FEDMCL	RBC [2] for Tap Water	39G00101	39G00201	39G00201D	39G00202	39G00202D	39G00301	39G00301D	39G00401
Sampling Date					4/2/96	4/2/96	4/2/96	8/29/96	8/29/96	4/3/96	4/3/96	4/3/96
Radiological, pCi/L												
Gross Alpha	13	15 p	15	ND	6.57	33.3	38.5	7.17	6.27	4.69	0.85	11.5
Gross Alpha, Uncertainty	ND	ND	ND	ND	ND	ND	ND	1.11	1.02	ND	ND	ND
Gross Beta	9.5	ND	ND	ND	7.53	40.6	39.3	10.5	10.4	12.5	10.2	15.8
Gross Beta, Uncertainty	ND	ND	ND	ND	ND	ND	ND	1.32	1.34	ND	ND	ND
Lead-210	ND	ND	ND	ND	NA	NA	NA	-0.01	-0.2	NA	NA	NA
Lead-210, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.35	0.34	NA	NA	NA
Polonium-210	ND	ND	ND	ND	NA	NA	NA	0.16	0.18	NA	NA	NA
Polonium-210, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.04	0.07	NA	NA	NA
Potassium-40	ND	ND	ND	ND	NA	NA	NA	-20.5	-24.7	NA	NA	NA
Potassium-40, Uncertainty	ND	ND	ND	ND	NA	NA	NA	10.5	10.4	NA	NA	NA
Radium-226	ND	ND	ND	ND	NA	NA	NA	0.27	0.28	NA	NA	NA
Radium-226, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.05	0.05	NA	NA	NA
Thorium-228	ND	ND	ND	ND	NA	NA	NA	1.33	1.31	NA	NA	NA
Thorium-228, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.16	0.16	NA	NA	NA
Thorium-230	ND	ND	ND	ND	NA	NA	NA	0.62	0.39	NA	NA	NA
Thorium-230, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.08	0.06	NA	NA	NA
Uranium-234	ND	ND	ND	ND	NA	NA	NA	0.16	0.15	NA	NA	NA
Uranium-234, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.03	0.03	NA	NA	NA
Uranium-238	ND	ND	ND	ND	NA	NA	NA	0.11	0.09	NA	NA	NA
Uranium-238, Uncertainty	ND	ND	ND	ND	NA	NA	NA	0.03	0.02	NA	NA	NA

Appendix E.

Table E-3. Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID	Background Screening [1]		FDEPG		Primary FEDMCL		RBC [2] for Tap Water		39G00501	
Sampling Date									4/3/96	
Radiological, pCi/L										
Gross Alpha	13		15	p	15		ND		1.43	
Gross Alpha, Uncertainty	ND		ND		ND		ND		ND	
Gross Beta	9.5		ND		ND		ND		5.51	
Gross Beta, Uncertainty	ND		ND		ND		ND		ND	
Lead-210	ND		ND		ND		ND		NA	
Lead-210, Uncertainty	ND		ND		ND		ND		NA	
Polonium-210	ND		ND		ND		ND		NA	
Polonium-210, Uncertainty	ND		ND		ND		ND		NA	
Potassium-40	ND		ND		ND		ND		NA	
Potassium-40, Uncertainty	ND		ND		ND		ND		NA	
Radium-226	ND		ND		ND		ND		NA	
Radium-226, Uncertainty	ND		ND		ND		ND		NA	
Thorium-228	ND		ND		ND		ND		NA	
Thorium-228, Uncertainty	ND		ND		ND		ND		NA	
Thorium-230	ND		ND		ND		ND		NA	
Thorium-230, Uncertainty	ND		ND		ND		ND		NA	
Uranium-234	ND		ND		ND		ND		NA	
Uranium-234, Uncertainty	ND		ND		ND		ND		NA	
Uranium-238	ND		ND		ND		ND		NA	
Uranium-238, Uncertainty	ND		ND		ND		ND		NA	

Appendix E.

Table E-3 Summary of Positive Detections in Groundwater Analytical Results, Study Area 39

Naval Training Center, Orlando
Orlando, FL

NOTES:

[1] Groundwater background screening value is twice the average of detected concentrations for inorganic analytes and gross radioactivity.

[2] RBC = Risk-Based Concentration Table, USEPA Region III, March 1997, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is treatment technology action limit for lead in drinking water distribution system identified in Drinking Water Standards and Health Advisories (USEPA, 1996). For essential nutrients (calcium, magnesium, potassium, and sodium) screening values were derived based on recommended daily allowances (RDAs).

p = Primary Standard
s = Secondary Standard.
o = Organoleptic
c = Carcinogen
st = Systemic Toxicant
mc = based on minimum criteria
n = noncarcinogenic pathway
c = carcinogenic pathway
ND = Not determined.
USEPA = U.S. Environmental Protection Agency
FDEPGCTL = Florida Department of Environmental Protection, Groundwater Cleanup Target Levels, Chapter 62-785 FAC, April 30, 1998.
FEDMCL = Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, October 1996.

ug/L = micrograms per liter.
mg/L = milligrams per liter.
pCi/L = picocuries per liter

NA = Parameter not requested to be analyzed
B = For inorganics, reported concentration is between the instrument detection limit (IDL) and Contract Required Detection Limit (CRDL).
J = Reported concentration is estimated.

ND = Regulatory guidance not available or not determined
Blank cell in sample results indicate that the analyte or compound has not been detected at the reporting limit.
Bold/shaded numbers indicate exceedance of groundwater guidance and background. For essential nutrients (calcium, magnesium, sodium, potassium), RBCs are used for comparison.

APPENDIX F

SUMMARY OF ANALYTICAL RESULTS (CLP LABORATORY)

TABLE F-1

SUMMARY OF SOIL ANALYTICAL RESULTS
TARGET ANALYTE LIST AND TARGET COMPOUND LIST ANALYSES

Appendix F

Table F-1. Summary of Soil Analytical Results

Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando

Orlando, FL

Sample ID	39B00101		39B00102		39B00201		39B00201D		39B00202		39B00301		39B00302		39B00302D		39B00401		39B00402		39B00501	
Lab ID	MA507007		MA507010		MA507008		MA507009		MA507012		MA507011		MA521002		MA521003		MA507013		MA521004		MA521010	
Sampling Date	19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		20-Mar-96		20-Mar-96		19-Mar-96		20-Mar-96		20-Mar-96	
Volatile organics, ug/kg																						
1,1,1-Trichloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,1,2,2-Tetrachloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,1,2-Trichloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,1-Dichloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,1-Dichloroethene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,2-Dichloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,2-Dichloroethene (total)	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
1,2-Dichloropropane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
2-Butanone	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
2-Hexanone	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
4-Methyl-2-pentanone	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Acetone	10	U	10	U	12	U	11	U	11	U	11	U	11	U	30	U	10	U	12	U	10	U
Benzene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Bromodichloromethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Bromoform	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Bromomethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Carbon disulfide	10	U	10	U	4	J	3	J	11	U	1	J	11	U	11	U	10	U	12	U	2	J
Carbon tetrachloride	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Chlorobenzene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Chloroethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Chloroform	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Chloromethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
cis-1,3-Dichloropropene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Dibromochloromethane	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Ethylbenzene	1	J	10	U	12	U	11	U	1	J	11	U	11	U	11	U	10	U	12	U	10	U
Methylene chloride	10	U	10	U	6	J	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Styrene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Tetrachloroethene	10	U	10	U	12	U	11	U	11	U	3	J	11	U	11	U	10	U	12	U	10	U
Toluene	10	U	10	U	1	J	11	U	11	U	11	U	2	J	11	U	5	J	15		7	J
trans-1,3-Dichloropropene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Trichloroethene	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Vinyl chloride	10	U	10	U	12	U	11	U	11	U	11	U	11	U	11	U	10	U	12	U	10	U
Xylene (total)	3	J	10	U	12	U	11	U	6	J	1	J	11	U	11	U	10	U	1	J	10	U
Semivolatile organics, ug/kg																						
1,2,4-Trichlorobenzene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
1,2-Dichlorobenzene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U

Appendix F
Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00101		39B00102		39B00201		39B00201D		39B00202		39B00301		39B00302		39B00302D		39B00401		39B00402		39B00501	
Lab ID	MA507007		MA507010		MA507008		MA507009		MA507012		MA507011		MA521002		MA521003		MA507013		MA521004		MA521010	
Sampling Date	19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		19-Mar-96		20-Mar-96		20-Mar-96		19-Mar-96		20-Mar-96		20-Mar-96	
1,3-Dichlorobenzene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
1,4-Dichlorobenzene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,2'-oxybis(1-Chloropropane)	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,4,5-Trichlorophenol	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
2,4,6-Trichlorophenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,4-Dichlorophenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,4-Dimethylphenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,4-Dinitrophenol	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
2,4-Dinitrotoluene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2,6-Dinitrotoluene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2-Chloronaphthalene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2-Chlorophenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2-Methylnaphthalene	350	U	370	U	150	J	170	J	350	U	360	U	370	U	370	U	210	J	390	U	350	J
2-Methylphenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
2-Nitroaniline	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
2-Nitrophenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
3,3'-Dichlorobenzidine	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
3-Nitroaniline	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
4,6-Dinitro-2-methylphenol	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
4-Bromophenyl-phenylether	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
4-Chloro-3-methylphenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
4-Chloroaniline	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
4-Chlorophenyl-phenylether	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
4-Methylphenol	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
4-Nitroaniline	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
4-Nitrophenol	870	U	930	U	920	U	920	U	870	U	900	U	940	U	940	U	880	U	970	U	880	U
Acenaphthene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	60	J
Acenaphthylene	350	U	370	U	370	U	370	U	350	U	39	J	370	U	370	U	350	U	390	U	350	U
Anthracene	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	180	J
Benzo(a)anthracene	350	U	370	U	38	J	40	J	350	U	100	J	370	U	370	U	41	J	390	U	640	
Benzo(a)pyrene	350	U	370	U	370	U	43	J	350	U	180	J	370	U	370	U	47	J	390	U	520	
Benzo(b)fluoranthene	350	U	370	U	39	J	43	J	350	U	200	J	370	U	370	U	70	J	390	U	520	
Benzo(g,h,i)perylene	350	U	370	U	49	J	49	J	350	U	150	J	370	U	370	U	65	J	390	U	300	J
Benzo(k)fluoranthene	350	U	370	U	37	J	37	J	350	U	140	J	370	U	370	U	49	J	390	U	530	
bis(2-Chloroethoxy)methane	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
bis(2-Chloroethyl)ether	350	U	370	U	370	U	370	U	350	U	360	U	370	U	370	U	350	U	390	U	350	U
bis(2-Ethylhexyl)phthalate	47	J	79	J	49	J	170	J	350	U	43	J	370	U	370	U	350	U	1800	U	350	U

Appendix F

Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00101	39B00102	39B00201	39B00201D	39B00202	39B00301	39B00302	39B00302D	39B00401	39B00402	39B00501
Lab ID	MA507007	MA507010	MA507008	MA507009	MA507012	MA507011	MA521002	MA521003	MA507013	MA521004	MA521010
Sampling Date	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96
Butylbenzylphthalate	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Carbazole	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	120 J
Chrysene	350 U	370 U	62 J	68 J	350 U	160 J	370 U	370 U	79 J	390 U	690
Di-n-butylphthalate	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Di-n-octylphthalate	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Dibenz(a,h)anthracene	350 U	370 U	370 U	370 U	350 U	47 J	370 U	370 U	350 U	390 U	110 J
Dibenzofuran	350 U	370 U	38 J	40 J	350 U	360 U	370 U	370 U	56 J	390 U	120 J
Diethylphthalate	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Dimethylphthalate	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Fluoranthene	350 U	370 U	50 J	52 J	350 U	91 J	370 U	370 U	56 J	390 U	1300
Fluorene	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	51 J
Hexachlorobenzene	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Hexachlorobutadiene	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Hexachlorocyclopentadiene	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Hexachloroethane	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Indeno(1,2,3-cd)pyrene	350 U	370 U	370 U	370 U	350 U	120 J	370 U	370 U	45 J	390 U	290 J
Isophorone	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
N-Nitroso-di-n-propylamine	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
N-Nitrosodiphenylamine	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Naphthalene	350 U	370 U	59 J	67 J	350 U	360 U	370 U	370 U	110 J	390 U	210 J
Nitrobenzene	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Pentachlorophenol	870 U	930 U	920 U	920 U	870 U	900 U	940 U	940 U	880 U	970 U	880 U
Phenanthrene	350 U	370 U	140 J	150 J	350 U	360 U	370 U	370 U	150 J	390 U	1100
Phenol	350 U	370 U	370 U	370 U	350 U	360 U	370 U	370 U	350 U	390 U	350 U
Pyrene	42 J	370 U	69 J	91 J	350 U	120 J	370 U	370 U	67 J	390 U	1400
Pesticides/PCBs, ug/kg											
4,4'-DDD	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
4,4'-DDE	1.8 J	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
4,4'-DDT	7.9	3.7 U	18 U	18 U	3 J	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Aldrin	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
alpha-BHC	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
alpha-Chlordane	2.7 J	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Aroclor-1016	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U
Aroclor-1221	70 U	74 U	370 U	370 U	70 UJ	180 U	75 U	75 U	350 U	78 U	350 U
Aroclor-1232	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U
Aroclor-1242	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U
Aroclor-1248	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U

Appendix F
Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00101	39B00102	39B00201	39B00201D	39B00202	39B00301	39B00302	39B00302D	39B00401	39B00402	39B00501
Lab ID	MA507007	MA507010	MA507008	MA507009	MA507012	MA507011	MA521002	MA521003	MA507013	MA521004	MA521010
Sampling Date	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96
Aroclor-1254	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U
Aroclor-1260	34 U	37 U	180 U	180 U	34 UJ	89 U	37 U	37 U	170 U	38 U	170 U
beta-BHC	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
delta-BHC	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Dieldrin	1.3 J	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Endosulfan I	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Endosulfan II	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Endosulfan sulfate	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Endrin	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Endrin aldehyde	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
Endrin ketone	3.4 U	3.7 U	18 U	18 U	3.4 UJ	8.9 U	3.7 U	3.7 U	17 U	3.8 U	17 U
gamma-BHC (Lindane)	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
gamma-Chlordane	3.1	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Heptachlor	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Heptachlor epoxide	1.8 U	1.9 U	9.3 U	9.3 U	1.8 UJ	4.6 U	1.9 U	1.9 U	8.9 U	2 U	8.9 U
Methoxychlor	18 U	19 U	93 U	93 U	18 UJ	46 U	19 U	19 U	89 U	20 U	89 U
Toxaphene	180 U	190 U	930 U	930 U	180 UJ	460 U	190 U	190 U	890 U	200 U	890 U
Herbicides, ug/kg											
2,4,5-T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-TP (Silvex)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DP (Dichloroprop)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dicamba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MCPP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives, ug/g											
1,3,5-Trinitrobenzene	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
1,3-Dinitrobenzene	0.08 U	0.08 U	0.09 U	0.09 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
2,4,6-Trinitrotoluene	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
2-Amino-4,6-Dinitrotoluene	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
2-Nitrotoluene	0.15 U	0.15 U	0.16 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
3-Nitrotoluene	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
4-Amino-2,6-Dinitrotoluene	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U
4-Nitrotoluene	0.18 U	0.18 U	0.18 U	0.08 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U

Appendix F
Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00101	39B00102	39B00201	39B00201D	39B00202	39B00301	39B00302	39B00302D	39B00401	39B00402	39B00501
Lab ID	MA507007	MA507010	MA507008	MA507009	MA507012	MA507011	MA521002	MA521003	MA507013	MA521004	MA521010
Sampling Date	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96	19-Mar-96	20-Mar-96	20-Mar-96
HMX	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
RDX	0.17 U	0.17 U	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Tetryl (total)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Inorganics, mg/kg											
Aluminum	729 J	6.5 BJ	1440 J	1690 J	641 J	690 J	185 J	264 J	2430 J	1830 J	875 J
Antimony	2.3 U	2.4 U	2.4 U	2.4 U	2.3 U	2.3 U	2.4 U	2.5 U	2.3 U	2.5 U	2.3 U
Arsenic	0.36 B	0.29 U	4.7	4.8	0.27 U	0.32 B	0.29 U	0.3 U	6.7	0.3 U	2.3
Barium	4.7 BJ	0.17 BJ	17.7 BJ	22.8 BJ	4.6 BJ	6.6 BJ	0.32 BJ	0.44 BJ	21.8 BJ	0.58 BJ	17.5 BJ
Beryllium	0.03 B	0.03 U	0.12 B	0.23 B	0.03 U	0.05 B	0.03 U	0.03 U	0.18 B	0.03 U	0.14 B
Cadmium	0.58 U	0.4 U	1.4 U	1.6 U	0.38 U	0.51 B	0.4 U	0.41 U	0.38 U	0.52 U	0.62 U
Calcium	90600	163 B	147000	151000	1430	18900	256 B	397 B	5240	415 B	67200
Chromium	3.5	1.2 B	6.9	7.5	2.6	1.7 B	1.5 B	2.1 B	2.9	3	3.7
Cobalt	0.31 U	0.33 U	2.4 B	4.8 B	0.31 U	0.32 U	0.34 U	0.34 U	0.79 B	0.35 U	2.1 B
Copper	1.9 B	0.44 U	6.1	7.2	0.92 B	1.4 B	0.85 B	1 B	4.4 B	1.1 B	4.8 B
Iron	335	87.5	5770	7840	213	422	136	124	2820	103	1930
Lead	14.5	0.26 U	21.5	24.3	19.5	17.6	0.59 B	1.5	11.5	1.5	23.9
Magnesium	702 B	4.9 U	1060 B	1040 B	11.1 B	136 B	5 U	8.6 B	97.6 B	31.2 B	983 B
Manganese	11.7	0.96 B	34.1	46	1.4 B	6.5	0.95 B	0.91 B	10.9	0.59 B	43.5
Mercury	0.03 U	0.04 B	0.04 U	0.07 B	0.03 U	0.05 B	0.04 U	0.04 U	0.04 U	0.04 U	0.03 U
Nickel	1.6 U	1.7 U	3.5 B	7.9 B	1.6 U	1.7 U	1.7 U	1.7 U	2.8 B	1.8 U	3.6 B
Potassium	160 U	170 U	168 U	169 U	160 U	165 U	172 U	173 U	161 U	178 U	162 U
Selenium	0.39 BJ	0.29 UJ	0.44 BJ	0.4 BJ	0.27 UJ	0.28 UJ	0.29 UJ	0.3 UJ	0.39 J	0.3 UJ	0.28 UJ
Silver	0.46 U	0.49 U	0.48 U	0.48 U	0.46 U	0.47 U	0.49 U	0.5 U	0.46 U	0.51 U	0.46 U
Sodium	57.6 U	28.5 U	83.9 B	114 B	22 U	35.7 B	41.3 U	16.2 U	35.8 U	19.6 U	76.2 B
Thallium	0.18 B	0.19 U	0.19 U	0.19 U	0.18 U	0.19 U	0.19 U	0.19 U	0.19 B	0.2 U	0.18 U
Vanadium	6.6 B	0.35 U	9.5 B	10 B	0.67 B	1.4 B	0.36 U	0.36 U	2.3 B	0.37 U	3.4 B
Zinc	6.1	2.8 B	24.8	36	1.9 B	7.9	1.2 B	2.6 B	20.8	1.4 B	21.6
General Chemistry, mg/kg											
Total Petroleum Hydrocarbon	26.1	1.8 U	70.8	74.1	1.7 U	9.3	1.8 U	1.9 U	4.7	1.9 U	48.1

Appendix F
Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00502	39S00101	39S00201	39S00301	39S00301D	39S00401	39S00501	39S00501D	39S00601	39S00701	39S00801
Lab ID	MA521005	MA521008	MA521009	MA544002	MA544003	MA544004	MA544005	MA544006	MA544007	MA544008	MA544009
Sampling Date	20-Mar-96	20-Mar-96	20-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96
Volatile organics, ug/kg											
1,1,1-Trichloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,1,2,2-Tetrachloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,1,2-Trichloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,1-Dichloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,1-Dichloroethene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,2-Dichloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,2-Dichloroethene (total)	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
1,2-Dichloropropane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
2-Butanone	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
2-Hexanone	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
4-Methyl-2-pentanone	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Acetone	11 U	11 U	14 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Benzene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Bromodichloromethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Bromoform	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Bromomethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Carbon disulfide	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Carbon tetrachloride	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Chlorobenzene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Chloroethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Chloroform	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Chloromethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
cis-1,3-Dichloropropene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Dibromochloromethane	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Ethylbenzene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Methylene chloride	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Styrene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Tetrachloroethene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Toluene	11 U	42	6 J	10 U	10 U	27	75	86	76	83	59
trans-1,3-Dichloropropene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Trichloroethene	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Vinyl chloride	11 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U	10 U
Xylene (total)	11 U	6 J	1 J	10 U	10 U	11 U	5 J	5 J	4 J	4 J	2 J
Semivolatile organics, ug/kg											
1,2,4-Trichlorobenzene	370 U	340 U	340 U	340 U	340 U	360 U	350 U	350 U	360 U	360 U	350 U
1,2-Dichlorobenzene	370 U	340 U	340 U	340 U	340 U	360 U	350 U	350 U	360 U	360 U	350 U

Appendix F

Table F-1. Summary of Soil Analytical Results

Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando

Orlando, FL

Sample ID	39B00502		39S00101		39S00201		39S00301		39S00301D		39S00401		39S00501		39S00501D		39S00601		39S00701		39S00801	
Lab ID	MA521005		MA521008		MA521009		MA544002		MA544003		MA544004		MA544005		MA544006		MA544007		MA544008		MA544009	
Sampling Date	20-Mar-96		20-Mar-96		20-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96	
1,3-Dichlorobenzene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
1,4-Dichlorobenzene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,2'-oxybis(1-Chloropropane)	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,4,5-Trichlorophenol	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
2,4,6-Trichlorophenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,4-Dichlorophenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,4-Dimethylphenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,4-Dinitrophenol	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
2,4-Dinitrotoluene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2,6-Dinitrotoluene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2-Chloronaphthalene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2-Chlorophenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2-Methylnaphthalene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	44	J	360	U	360	U	48	J
2-Methylphenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
2-Nitroaniline	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
2-Nitrophenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
3,3'-Dichlorobenzidine	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
3-Nitroaniline	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
4,6-Dinitro-2-methylphenol	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
4-Bromophenyl-phenylether	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
4-Chloro-3-methylphenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
4-Chloroaniline	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
4-Chlorophenyl-phenylether	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
4-Methylphenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
4-Nitroaniline	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
4-Nitrophenol	920	U	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
Acenaphthene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Acenaphthylene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	61	J	360	U	350	U
Anthracene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Benzo(a)anthracene	370	U	340	U	340	U	340	U	340	U	360	U	52	J	66	J	110	J	310	J	350	U
Benzo(a)pyrene	370	U	340	U	340	U	340	U	340	U	360	U	57	J	78	J	200	J	350	J	350	U
Benzo(b)fluoranthene	370	U	340	U	340	U	340	U	340	U	360	U	91	J	92	J	250	J	450		350	U
Benzo(g,h,i)perylene	370	U	340	U	340	U	340	U	340	U	360	U	59	J	79	J	220	J	190	J	350	U
Benzo(k)fluoranthene	370	U	340	U	340	U	340	U	340	U	360	U	70	J	81	J	190	J	380		350	U
bis(2-Chloroethoxy)methane	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
bis(2-Chloroethyl)ether	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
bis(2-Ethylhexyl)phthalate	370	U	340	U	340	U	340	U	340	U	47	J	350	U	100	J	41	J	360	U	350	U

Appendix F

Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00502		39S00101		39S00201		39S00301		39S00301D		39S00401		39S00501		39S00501D		39S00601		39S00701		39S00801	
Lab ID	MA521005		MA521008		MA521009		MA544002		MA544003		MA544004		MA544005		MA544006		MA544007		MA544008		MA544009	
Sampling Date	20-Mar-96		20-Mar-96		20-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96		22-Mar-96	
Butylbenzylphthalate	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Carbazole	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	61	J	350	U
Chrysene	370	U	340	U	340	U	340	U	340	U	360	U	87	J	110	J	290	J	540		44	J
Di-n-butylphthalate	370	U	340	U	340	U	40	J	340	U	170	J	350	U	73	J	100	J	360	U	200	J
Di-n-octylphthalate	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Dibenz(a,h)anthracene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	48	J	75	J	350	U
Dibenzofuran	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Diethylphthalate	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Dimethylphthalate	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Fluoranthene	370	U	340	U	340	U	340	U	340	U	360	U	73	J	91	J	190	J	710	J	39	J
Fluorene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Hexachlorobenzene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Hexachlorobutadiene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Hexachlorocyclopentadiene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Hexachloroethane	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Indeno(1,2,3-cd)pyrene	370	U	340	U	340	U	340	U	340	U	360	U	49	J	56	J	160	J	210	J	350	U
Isophorone	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
N-Nitroso-di-n-propylamine	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
N-Nitrosodiphenylamine	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Naphthalene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Nitrobenzene	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Pentachlorophenol	55	J	860	U	860	U	860	U	850	U	900	U	890	U	890	U	900	U	900	U	870	U
Phenanthrene	370	U	340	U	340	U	340	U	340	U	360	U	54	J	59	J	59	J	410	J	47	J
Phenol	370	U	340	U	340	U	340	U	340	U	360	U	350	U	350	U	360	U	360	U	350	U
Pyrene	370	U	340	U	340	U	340	U	340	U	360	U	120	J	130	J	220	J	780		36	J
Pesticides/PCBs, ug/kg																						
4,4'-DDD	3.7	UJ	3.4	U	3.4	U	3.4	U	3.4	U	3.6	U	7	U	7	U	8.9	U	7.2	U	3.4	UJ
4,4'-DDE	3.7	UJ	3.6		3.4	U	3.4	U	3.4	U	1.9	J	12		11		8.9	U	5.3	J	2.3	J
4,4'-DDT	3.7	UJ	3.4	U	3.4	U	3.4	U	3.4	U	3.6	U	14	NJ	13		8.9	U	11		4.2	J
Aldrin	1.9	UJ	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	3.6	U	3.6	U	4.6	U	3.7	U	1.8	UJ
alpha-BHC	1.9	UJ	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	3.6	U	3.6	U	4.6	U	3.7	U	1.8	UJ
alpha-Chlordane	1.9	UJ	1.8	U	1.8	U	1.8	U	1.7	U	1.1	J	2.6	J	1.9	J	4.6	U	20		1.8	UJ
Aroclor-1016	37	UJ	34	U	34	U	34	U	34	U	36	U	70	U	70	U	89	U	72	U	34	UJ
Aroclor-1221	74	UJ	69	U	69	U	69	U	68	U	73	U	140	U	140	U	180	U	150	U	70	UJ
Aroclor-1232	37	UJ	34	U	34	U	34	U	34	U	36	U	70	U	70	U	89	U	72	U	34	UJ
Aroclor-1242	37	UJ	34	U	34	U	34	U	34	U	36	U	70	U	70	U	89	U	72	U	34	UJ
Aroclor-1248	37	UJ	34	U	34	U	34	U	34	U	36	U	70	U	70	U	89	U	72	U	34	UJ

Appendix F
Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00502	39S00101	39S00201	39S00301	39S00301D	39S00401	39S00501	39S00501D	39S00601	39S00701	39S00801
Lab ID	MA521005	MA521008	MA521009	MA544002	MA544003	MA544004	MA544005	MA544006	MA544007	MA544008	MA544009
Sampling Date	20-Mar-96	20-Mar-96	20-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96
Aroclor-1254	37 UJ	34 U	34 U	34 U	34 U	36 U	70 U	70 U	89 U	72 U	34 UJ
Aroclor-1260	37 UJ	34 U	34 U	34 U	34 U	36 U	70 U	70 U	89 U	72 U	34 UJ
beta-BHC	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
delta-BHC	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
Dieldrin	3.7 UJ	2.1 J	3.4 U	3.4 U	3.4 U	1.2 J	7 U	7 U	8.9 U	7.2 U	3.4 UJ
Endosulfan I	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
Endosulfan II	3.7 UJ	3.4 U	3.4 U	3.4 U	3.4 U	3.6 U	7 U	7 U	8.9 U	7.2 U	3.4 UJ
Endosulfan sulfate	3.7 UJ	3.4 U	3.4 U	3.4 U	3.4 U	3.6 U	7 U	7 U	8.9 U	7.2 U	3.4 UJ
Endrin	3.7 UJ	3.4 U	3.4 U	3.4 U	3.4 U	3.6 U	7 U	7 U	8.9 U	7.2 U	3.4 UJ
Endrin aldehyde	3.7 UJ	3.4 U	3.4 U	3.4 U	3.4 U	3.6 U	7 U	7 U	8.9 U	7.2 U	3.4 UJ
Endrin ketone	3.7 UJ	3.4 U	3.4 U	3.4 U	3.4 U	3.6 U	7 U	7 U	8.9 U	7.2 U	3.4 UJ
gamma-BHC (Lindane)	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
gamma-Chlordane	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	0.78 J	2.7 J	1.9 J	4.6 U	18	1.8 UJ
Heptachlor	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
Heptachlor epoxide	1.9 UJ	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	3.6 U	3.6 U	4.6 U	3.7 U	1.8 UJ
Methoxychlor	19 UJ	18 U	18 U	18 U	17 U	18 U	36 U	36 U	46 U	37 U	18 UJ
Toxaphene	190 UJ	180 U	180 U	180 U	170 U	180 U	360 U	360 U	460 U	370 U	180 UJ
Herbicides, ug/kg											
2,4,5-T	NA	NA	NA	NA	NA	NA	11 U	11 U	11 U	11 U	10 U
2,4,5-TP (Silvex)	NA	NA	NA	NA	NA	NA	11 U	11 U	11 U	11 U	10 U
2,4-D	NA	NA	NA	NA	NA	NA	53 U	53 U	54 U	54 U	52 U
2,4-DB	NA	NA	NA	NA	NA	NA	53 U	53 U	54 U	54 U	100 U
2,4-DP (Dichloroprop)	NA	NA	NA	NA	NA	NA	53 U	53 U	54 U	54 U	52 U
Dalapon	NA	NA	NA	NA	NA	NA	110 U	110 U	110 U	110 U	100 U
Dicamba	NA	NA	NA	NA	NA	NA	11 U	11 U	11 U	11 U	10 U
Dinoseb	NA	NA	NA	NA	NA	NA	11 U	11 U	11 U	11 U	10 U
MCPA	NA	NA	NA	NA	NA	NA	5300 U	5300 U	5400 U	5400 U	5200 U
MCPP	NA	NA	NA	NA	NA	NA	5300 U	5300 U	5400 U	5400 U	5200 U
Explosives, ug/g											
1,3,5-Trinitrobenzene	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	NA	NA	NA	NA	NA
2-Amino-4,6-Dinitrotoluene	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	NA	NA	NA	NA	NA
2-Nitrotoluene	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	NA	NA	NA	NA	NA
3-Nitrotoluene	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	NA	NA	NA	NA	NA
4-Amino-2,6-Dinitrotoluene	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	NA	NA	NA	NA	NA
4-Nitrotoluene	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	NA	NA	NA	NA	NA

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Table F-1. Summary of Soil Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00502	39S00101	39S00201	39S00301	39S00301D	39S00401	39S00501	39S00501D	39S00601	39S00701	39S00801
Lab ID	MA521005	MA521008	MA521009	MA544002	MA544003	MA544004	MA544005	MA544006	MA544007	MA544008	MA544009
Sampling Date	20-Mar-96	20-Mar-96	20-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96	22-Mar-96
HMX	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	NA	NA	NA	NA	NA
RDX	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	NA	NA	NA	NA	NA
Tetryl (total)	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	NA	NA	NA	NA
Inorganics, mg/kg											
Aluminum	7.9 BJ	134 J	13.9 BJ	117	113	408	1590	1660	1110	3460	476
Antimony	2.4 U	2.3 U	2.2 U	2.2 U	2.2 U	2.4 U	2.3 U	2.3 U	2.4 U	2.4 U	2.3 U
Arsenic	0.5 BJ	0.33 B	0.27 U	0.42 U	0.27 U	0.9 U	1.5 UJ	1.3 U	1.1 U	0.58 U	0.58 U
Barium	0.12 U	11.8 BJ	0.41 BJ	1.6 U	1.6 U	8.9 B	12.4 B	15.3 B	6.4 B	26.5 B	4.7 B
Beryllium	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.04 B	0.07 B	0.1 B	0.05 B	0.09 B	0.04 B
Cadmium	0.45 U	0.37 U	0.37 U	0.37 U	0.37 U	0.39 U	0.38 U	0.38 U	0.39 U	0.39 U	0.37 U
Calcium	72.8 B	2700	148 B	357 B	492 B	8720	27200	27000	43000	37600	4580
Chromium	0.49 U	0.71 B	0.45 U	0.45 U	0.45 U	1.1 B	3.7	3.6	3.4	7.2	1.1 B
Cobalt	0.33 U	0.31 U	0.31 U	0.31 U	0.31 U	0.33 U	0.32 U	0.32 U	0.32 U	0.32 U	0.31 U
Copper	0.51 B	0.91 B	0.41 U	1.3 B	1.6 B	3.5 B	5 B	8.4	3.5 B	3.8 B	2 B
Iron	202	119	16.6 B	58.5	60.3	202	762	928	682	361	349
Lead	0.26 U	8.6	0.51 B	0.28 U	0.25 U	3.8	17.1	16.1	8.8	14.9	5.3
Magnesium	4.9 U	38.3 B	4.6 U	9.9 B	12.3 B	82.8 B	262 B	244 B	330 B	328 B	71.4 B
Manganese	0.65 B	5.1	0.38 B	0.61 B	0.61 B	5.1	11.4	14.1	10	9.4	5.6
Mercury	0.04 B	0.07 B	0.03 U	0.03 U	0.03 U	0.05 B	0.04 U	0.03 U	0.04 U	0.03 U	0.03 U
Nickel	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.7 U	1.7 U	1.6 U
Potassium	170 U	159 U	157 U	157 U	157 U	167 U	163 U	163 U	166 U	166 U	159 U
Selenium	0.29 UJ	0.27 UJ	0.27 UJ	0.27 UJ	0.31 U	0.33 J	0.31 J	0.28 UJ	0.28 UJ	0.28 UJ	0.27 UJ
Silver	0.49 U	0.96 B	0.45 U	0.45 UR	0.45 UR	0.48 UR	0.47 UR	0.47 UR	0.48 UR	0.48 UR	0.46 UR
Sodium	14 U	15.7 U	18 U	34.6 U	34 U	47.1 U	55.5 U	44.6 U	43.8 U	45 U	43 U
Thallium	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.18 U
Vanadium	0.35 U	0.33 U	0.33 U	0.33 U	0.33 U	1.2 B	1.9 B	2.1 B	2.2 B	2.6 B	0.69 B
Zinc	1.1 B	10.9	2.5 B	4.5	5.6	8	24.3	30.6	30.3	21.3	8.8
General Chemistry, mg/kg											
Total Petroleum Hydrocarbon	1.8 U	1.7 U	1.7 U	1.7 U	1.7 U	4.7	26.5	29.8	24.5	101	9.8

TABLE F-2

SUMMARY OF SOIL ANALYTICAL RESULTS
POLYNUCLEAR AROMATIC HYDROCARBONS ONLY

Appendix F
Table F-2. Summary of Soil Analytical Results
Study Area 39 - Polynuclear Aromatic Hydrocarbons Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39S01801	39S02501	39S02701	39S02901	39S03101	39S03901	39S04301	39S05101	39S05501	39S05901	39S06001
Lab ID	J9601864-00	J9601864-00	J9601864-00	J9601864-00	J9601864-00	J9601864-00	J9601880-00	J9601880-00	J9601880-00	J9601880-00	J9601880-01
Sampling Date	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	3-Dec-96	4-Dec-96	4-Dec-96	5-Dec-96	5-Dec-96
PAHs, ug/kg											
1-Methylnaphthalene	6.5	2.5	8	2.5 U	70	16	180	2.5 U	2.5 U	2.5	4.5
2-Methylnaphthalene	10	4.5	11	2.5	48	22	210	3	3.5	4	5.5
Acenaphthene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	7.5	2.5 U	2.5 U	2.5 U	2.5 U
Acenaphthylene	5.5	16	36	3	12	70	140	2.5 U	4.5	5.5	14
Anthracene	10	39	60	12	14	130	140	6.5	9	8	48
Benzo(a)anthracene	18	20	6.5	2.5	20	110	170	2.5	4	8.5	65
Benzo(a)pyrene	30	43	70	4.5	48	220	300	2.5 U	5	12	100
Benzo(b)fluoranthene	7.5	10	18	2.5 U	13	75	120	2.5 U	4	5.5	32
Benzo(g,h,i)perylene	5	8.5	16	2.5 U	7.5	38	38	2.5 U	2.5 U	2.5 U	14
Benzo(k)fluoranthene	7.5	10	18	2.5 U	13	75	120	2.5 U	4	5.5	32
Chrysene	20	26	32	3	24	140	180	2.5	4.5	8.5	75
Dibenz(a,h)anthracene	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	10	12	2.5 U	2.5 U	2.5 U	3
Fluoranthene	24	23	20	3.5	18	140	140	2.5	8	12	100
Fluorene	3	2.5 U	3	2.5 U	4	3.5	8	2.5	2.5 U	2.5	5.5
Indeno(1,2,3-cd)pyrene	7	8.5	14	2.5 U	6	40	42	2.5 U	2.5 U	3.5	19
Naphthalene	7.5	4.5	8.5	3	17	14	100	3	3.5	4	6
Phenanthrene	14	10	16	4.5	60	55	180	7	13	16	60
Pyrene	26	44	70	4	28	180	180	3.5	8	12	100
Inorganics, mg/kg											
Arsenic	1 U	1 U	1 U	1 U	1 U	1 U	2.7	1 U	1 U	1 U	1 U

TABLE F-3

SUMMARY OF SOIL ANALYTICAL RESULTS
GROSS RADIOACTIVITY ONLY

Appendix F

Table F-3. Summary of Soil Analytical Results
Study Area 39 - Gross Radioactivity Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B00901		39B01001		39B01101		39S00901		39S01001		39S01101		39S01101D	
Lab ID	ABBOS*4		ABBOS*6		ABBOS*8		ABBOS*3		ABBOS*5		ABBOS*7		ABBOS*9	
Sampling Date	29-Aug-96		29-Aug-96		29-Aug-96		29-Aug-96		29-Aug-96		29-Aug-96		29-Aug-96	
Radiological, pCi/g														
Gross Alpha	0.04		0.09		0.6		0.13		0.86		0.57		0.69	
Gross Alpha, Uncertainty	0.05		0.06		0.11		0.07		0.14		0.1		0.14	
Gross Beta	0.1		0.03		0.68		0.27		1.48		0.73		0.72	
Gross Beta, Uncertainty	0.09		0.09		0.13		0.1		0.2		0.12		0.13	

TABLE F-4

SUMMARY OF SOIL ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS ONLY

Appendix F

Table F-4. Summary of Soil Analytical Results

Study Area 39 - Volatile Organic Compounds Only

Naval Training Center, Orlando

Orlando, FL

Sample ID	39B00905		39B01305		39B01405		39B01505		39B01605	
Lab ID	C7D080138002		C7D080138003		C7D080138001		C7D080138004		C7D080138005	
Sampling Date	27-Mar-97		28-Mar-97		28-Mar-97		28-Mar-97		28-Mar-97	
Volatile organics, ug/kg										
1,1,1-Trichloroethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,1,2,2-Tetrachloroethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,1,2-Trichloroethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,1-Dichloroethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,1-Dichloroethene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,2-Dichloroethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,2-Dichloroethene (total)	5.9	U	5.5	U	5.7	U	6	U	5.7	U
1,2-Dichloropropane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
2-Butanone	120	U	110	U	110	U	120	U	110	U
2-Hexanone	59	U	55	U	57	U	60	U	57	U
4-Methyl-2-pentanone	59	U	55	U	57	U	60	U	57	U
Acetone	120	U	110	U	110	U	120	U	110	U
Benzene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Bromodichloromethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Bromoform	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Bromomethane	12	U	11	U	11	U	12	U	11	U
Carbon disulfide	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Carbon tetrachloride	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Chlorobenzene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Chloroethane	12	U	11	U	11	U	12	U	11	U
Chloroform	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Chloromethane	12	U	11	U	11	U	12	U	11	U
cis-1,3-Dichloropropene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Dibromochloromethane	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Ethylbenzene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Methylene chloride	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Styrene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Tetrachloroethene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Toluene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
trans-1,3-Dichloropropene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Trichloroethene	5.9	U	5.5	U	5.7	U	6	U	5.7	U
Vinyl chloride	12	U	11	U	11	U	12	U	11	U
Xylene (total)	5.9	U	5.5	U	5.7	U	6	U	5.7	U

TABLE F-5

SUMMARY OF SOIL ANALYTICAL RESULTS
SUPPLEMENTAL PAH AND ARSENIC DATA

Appendix F
Table F-5. Summary of Soil Analytical Results
Study Area 39 -
Supplemental PAH and Arsenic Data

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B06101	39B06201	39B06301	39B06401	39B06401D	39B06501	39B06601	39B06703	39B06803	39B06901	39B07001
Lab ID	OR8948-15	OR8948-18	OR8948-21	OR8948-26	OR8948-27	OR8948-32	OR8948-34	OR8948-38	OR8948-41	OR8948-44	OR8948-47
Sampling Date	23-Sep-97	23-Sep-97	23-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97
PAHs, ug/kg											
1-Methylnaphthalene	NA	210 U	930	390	210 U	170 U	760	170 U	380	650	NA
2-Methylnaphthalene	NA	210 U	1400	820	210 U	170 U	2000	170 U	670	3400	NA
Acenaphthene	NA	210 U	1100	170 U	210 U	170 U	410	170 U	600	1800	NA
Acenaphthylene	NA	420 U	420 U	350 U	420 U	350 U	1500	340 U	340 U	610	NA
Anthracene	NA	21 U	21 U	17 U	21 U	17 U	21 U	17 U	17 U	31	NA
Benzo(a)anthracene	NA	21 U	400	380	21 U	17 U	150	33	190	1100	NA
Benzo(a)pyrene	NA	21 U	880	950	21 U	17 U	230	180	410	1600	NA
Benzo(b)fluoranthene	NA	42 U	940	860	42 U	35 U	300	190	460	3700	NA
Benzo(g,h,i)perylene	NA	42 U	820	830	42 U	35 U	380	350	400	2700	NA
Benzo(k)fluoranthene	NA	21 U	460	430	65	17 U	130	88	220	3700	NA
Chrysene	NA	21 U	1100	810	44	17 U	420	140	400	2500	NA
Dibenz(a,h)anthracene	NA	42 U	42 U	35 U	42 U	35 U	42 U	34 U	690	37 U	NA
Fluoranthene	NA	41 U	2100	1100	42 U	35 U	920	130	950	3600	NA
Fluorene	NA	42 U	42 U	35 U	42 U	35 U	42 U	34 U	34 U	79	NA
Indeno(1,2,3-cd)pyrene	NA	21 U	640	500	21 U	17 U	190	160	310	2300	NA
Naphthalene	NA	210 U	210 U	170 U	210 U	170 U	210 U	170 U	170 U	180 U	NA
Phenanthrene	NA	21 U	340	150	21 U	17 U	300	34	140	780	NA
Pyrene	NA	250	1800	1000	21 U	17 U	340	220	520	1900	NA
Inorganics, mg/kg											
Arsenic	0.5 U	NA	NA	0.98	0.61	2	NA	NA	NA	NA	0.75

Appendix F

Table F-5. Summary of Soil Analytical Results
Study Area 39 -
Supplemental PAH and Arsenic Data

Naval Training Center, Orlando
Orlando, FL

Sample ID	39B07101	39B07201	39B07301	39B07401	39S01801	39S02501	39S02701	39S02901	39S03101	39S03901	39S04301
Lab ID	OR8948-50	OR8948-53	OR8948-56	OR8948-59	J97000551	J97000552	J97000553	J97000554	J97000555	J97000556	J970005510
Sampling Date	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	2-Dec-96	3-Dec-96
PAHs, ug/kg											
1-Methylnaphthalene	NA	250	620	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	530	1600	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	230	240	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	350 U	1400	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	17 U	18 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	100	100	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	190	160	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	220	210	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	260	350	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	71	280	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	210	260	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	35 U	37 U	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	310	660	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	35 U	37 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	140	340	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	170 U	180 U	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	69	300	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	130	18 U	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics, mg/kg											
Arsenic	0.4 U	0.97	1.6	2.3	1 U	1 U	1 U	1 U	1 U	1 U	2.7

Appendix F
Table F-5. Summary of Soil Analytical Results
Study Area 39 -
Supplemental PAH and Arsenic Data

Naval Training Center, Orlando
Orlando, FL

Sample ID	39S05101	39S05501	39S05901	39S06001	39S06101	39S06102	39S06202	39S06301	39S06302	39S06401	39S06401D
Lab ID	J970005513	J970005514	J970005515	J970005518	OR8948-13	OR8948-14	OR8948-17	OR8948-19	OR8948-20	OR8948-22	OR8948-24
Sampling Date	4-Dec-96	4-Dec-96	5-Dec-96	5-Dec-96	23-Sep-97	23-Sep-97	23-Sep-97	23-Sep-97	23-Sep-97	24-Sep-97	24-Sep-97
PAHs, ug/kg											
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	510	1500	4900	210 U	280
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	1400	2000	5500	540	570
Acenaphthene	NA	NA	NA	NA	NA	NA	190 U	1800	5000	210 U	220
Acenaphthylene	NA	NA	NA	NA	NA	NA	780	350 U	1400	490	350 U
Anthracene	NA	NA	NA	NA	NA	NA	19 U	28	89	21 U	18 U
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	69	550	1600	67	130
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	97	1200	2800	160	260
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	170	1300	3000	210	310
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	38 U	1000	2600	340	260
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	47	650	1500	45	100
Chrysene	NA	NA	NA	NA	NA	NA	210	1500	3400	190	300
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	260	35 U	36 U	42 U	35 U
Fluoranthene	NA	NA	NA	NA	NA	NA	38 U	3000	9000	450	490
Fluorene	NA	NA	NA	NA	NA	NA	38 U	35 U	60	42 U	35 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	19 U	850	1900	120	190
Naphthalene	NA	NA	NA	NA	NA	NA	550	180 U	180 U	210 U	180 U
Phenanthrene	NA	NA	NA	NA	NA	NA	230	500	1300	60	110
Pyrene	NA	NA	NA	NA	NA	NA	19 U	2000	5100	930	300
Inorganics, mg/kg											
Arsenic	1 U	1 U	1 U	1 U	0.4 U	0.5 U	NA	NA	NA	1.4	1.2

Appendix F
Table F-5. Summary of Soil Analytical Results
Study Area 39 -
Supplemental PAH and Arsenic Data

Naval Training Center, Orlando
Orlando, FL

Sample ID	39S06402		39S06402D		39S06501		39S06501D		39S06502		39S06502D		39S06601		39S06602		39S06701		39S06702		39S06801	
Lab ID	OR8948-23		OR8948-25		OR8948-28		OR8948-29		OR8948-30		OR8948-31		OR8948-33		OR8948-35		OR8948-36		OR8948-37		OR8948-39	
Sampling Date	24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97		24-Sep-97	
PAHs, ug/kg																						
1-Methylnaphthalene	210	U	220	U	220	U	470		180	U	200	U	200		1900		480		180	U	170	U
2-Methylnaphthalene	210	U	220	U	480		1000		1400		460		510		4600		780		180	U	330	
Acenaphthene	210	U	220	U	220	U	630		540		300		180	U	510		500		180	U	170	U
Acenaphthylene	430	U	430	U	450	U	590		360	U	410	U	540		3100		370	U	360	U	340	U
Anthracene	21	U	22	U	22	U	37		18	U	20	U	18	U	720		19	U	18	U	17	U
Benzo(a)anthracene	23		52		22	U	200		390		210		97		100		220		32		78	
Benzo(a)pyrene	21	U	160		22	U	210		1500		700		170		98		480		140		140	
Benzo(b)fluoranthene	82		140		45	U	220		1300		700		200		120		530		110		160	
Benzo(g,h,i)perylene	43	U	210		45	U	310		1600		920		310		180		500		36	U	34	U
Benzo(k)fluoranthene	120		40		22	U	100		780		340		70		95		260		29		68	
Chrysene	69		140		22	U	20	U	1100		600		190		400		540		18	U	160	
Dibenz(a,h)anthracene	43	U	43	U	45	U	39	U	36	U	41	U	35	U	37	U	37	U	36	U	34	U
Fluoranthene	110		140		45	U	710		1200		430		35	U	37	U	930		220		490	
Fluorene	43	U	43	U	45	U	41		36	U	41	U	35	U	64		37	U	36	U	34	U
Indeno(1,2,3-cd)pyrene	21	U	110		22	U	140		930		530		160		52		400		91		100	
Naphthalene	210	U	220	U	220	U	190	U	180	U	200	U	180	U	2300		190	U	180	U	170	U
Phenanthrene	21	U	24		22	U	220		130		68		78		18	U	150		20		58	
Pyrene	21	U	22	U	360		380		940		460		350		18	U	680		290		360	
Inorganics, mg/kg																						
Arsenic	1.2		0.9		1.8		0.9	U	1.2		1	U	NA		NA		NA		NA		NA	

Appendix F
Table F-5. Summary of Soil Analytical Results
Study Area 39 -
Supplemental PAH and Arsenic Data

Naval Training Center, Orlando
Orlando, FL

Sample ID	39S06802	39S06901	39S06902	39S07001	39S07002	39S07101	39S07102	39S07201	39S07202	39S07301	39S07302
Lab ID	OR8948-40	OR8948-42	OR8948-43	OR8948-45	OR8948-46	OR8948-48	OR8948-49	OR8948-51	OR8948-52	OR8948-54	OR8948-55
Sampling Date	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97	24-Sep-97
PAHs, ug/kg											
1-Methylnaphthalene	700	460	240	NA	NA	NA	NA	340	380	170 U	440
2-Methylnaphthalene	1000	1100	460	NA	NA	NA	NA	230	670	910	910
Acenaphthene	1000	540	190	NA	NA	NA	NA	180 U	180 U	170 U	920
Acenaphthylene	340 U	350 U	350 U	NA	NA	NA	NA	350 U	360 U	340 U	350 U
Anthracene	45	17 U	18 U	NA	NA	NA	NA	18 U	18 U	17 U	63
Benzo(a)anthracene	280	90	54	NA	NA	NA	NA	34	23	120	200
Benzo(a)pyrene	680	190	150	NA	NA	NA	NA	18 U	240	320	530
Benzo(b)fluoranthene	650	230	160	NA	NA	NA	NA	35 U	58	310	520
Benzo(g,h,i)perylene	420	370	120	NA	NA	NA	NA	35 U	36 U	440	470
Benzo(k)fluoranthene	330	94	72	NA	NA	NA	NA	18 U	240	99	170
Chrysene	650	270	170	NA	NA	NA	NA	63	93	370	420
Dibenz(a,h)anthracene	34 U	35 U	35 U	NA	NA	NA	NA	35 U	36 U	360	35 U
Fluoranthene	2000	630	35 U	NA	NA	NA	NA	35 U	36 U	770	850
Fluorene	58	49	35 U	NA	NA	NA	NA	35 U	36 U	34 U	46
Indeno(1,2,3-cd)pyrene	400	140	84	NA	NA	NA	NA	18 U	18 U	230	360
Naphthalene	170 U	170 U	180 U	NA	NA	NA	NA	180 U	180 U	170 U	170 U
Phenanthrene	310	200	67	NA	NA	NA	NA	44	85	99	340
Pyrene	960	17 U	200	NA	NA	NA	NA	150	160	580	580
Inorganics, mg/kg											
Arsenic	NA	NA	NA	0.63	0.83	1.1	0.94	1.5	1.7	0.8 U	1.2

Appendix F

Table F-5. Summary of Soil Analytical Results

Study Area 39 -

Supplemental PAH and Arsenic Data

Naval Training Center, Orlando

Orlando, FL

Sample ID	39S07401	39S07402
Lab ID	OR8948-57	OR8948-58
Sampling Date	24-Sep-97	24-Sep-97
PAHs, ug/kg		
1-Methylnaphthalene	NA	NA
2-Methylnaphthalene	NA	NA
Acenaphthene	NA	NA
Acenaphthylene	NA	NA
Anthracene	NA	NA
Benzo(a)anthracene	NA	NA
Benzo(a)pyrene	NA	NA
Benzo(b)fluoranthene	NA	NA
Benzo(g,h,i)perylene	NA	NA
Benzo(k)fluoranthene	NA	NA
Chrysene	NA	NA
Dibenz(a,h)anthracene	NA	NA
Fluoranthene	NA	NA
Fluorene	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA
Naphthalene	NA	NA
Phenanthrene	NA	NA
Pyrene	NA	NA
Inorganics, mg/kg		
Arsenic	1.2	3.8

TABLE F-6

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
TARGET ANALYTE LIST AND TARGET COMPOUND LIST ANALYSES

Appendix F
Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101		39G00201		39G00201D		39G00202		39G00202D		39G00301		39G00301D		39G00401		39G00501		39G00601	
Lab ID	MA627002		MA627003		MA627004		ABBOW*8		ABBOW*7		MA640003		MA640004		MA640005		MA640002		MA801001	
Sampling Date	2-Apr-96		2-Apr-96		2-Apr-96		29-Aug-96		29-Aug-96		3-Apr-96		3-Apr-96		3-Apr-96		3-Apr-96		23-Apr-96	
Volatile Organics, ug/L																				
1,1,1-Trichloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,1,2,2-Tetrachloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,1,2-Trichloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,1-Dichloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,1-Dichloroethene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,2-Dibromo-3-chloropropane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,2-Dibromoethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,2-Dichlorobenzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,2-Dichloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,2-Dichloropropane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,3-Dichlorobenzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
1,4-Dichlorobenzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
2-Butanone	5	UR	5	UR	5	UR	NA		NA		5	UR	5	UR	5	UR	5	UR	NA	
2-Hexanone	5	U	5	U	5	U	NA		NA		5	U	5	U	5	U	5	U	NA	
4-Methyl-2-pentanone	5	U	5	U	5	U	NA		NA		5	U	5	U	5	U	5	U	NA	
Acetone	5	UR	3	R	3	R	NA		NA		2	R	5	UR	5	UR	2	R	NA	
Benzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Bromochloromethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Bromodichloromethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Bromoform	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Bromomethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Carbon disulfide	1	U	2		2		NA		NA		1		1		3		0.3	J	NA	
Carbon tetrachloride	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Chlorobenzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Chloroethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Chloroform	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Chloromethane	1	U	1	U	1	U	NA		NA		1	U	0.3	J	1	U	1	U	NA	
cis-1,2-Dichloroethene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
cis-1,3-Dichloropropene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Dibromochloromethane	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Ethylbenzene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Methylene chloride	2	U	2	U	2	U	NA		NA		2	U	2	U	2	U	2	U	NA	
Styrene	1	U	3		3		NA		NA		1	U	1	U	1	U	1	U	NA	

Appendix F

Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101		39G00201		39G00201D		39G00202		39G00202D		39G00301		39G00301D		39G00401		39G00501		39G00601	
Lab ID	MA627002		MA627003		MA627004		ABBOW*8		ABBOW*7		MA640003		MA640004		MA640005		MA640002		MA801001	
Sampling Date	2-Apr-96		2-Apr-96		2-Apr-96		29-Aug-96		29-Aug-96		3-Apr-96		3-Apr-96		3-Apr-96		3-Apr-96		23-Apr-96	
Tetrachloroethene	1	U	1	U	1	U	NA		NA		8		10		1	U	1	U	NA	
Toluene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
trans-1,2-Dichloroethene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
trans-1,3-Dichloropropene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Trichloroethene	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Vinyl chloride	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Xylene (total)	1	U	1	U	1	U	NA		NA		1	U	1	U	1	U	1	U	NA	
Semivolatile Organics, ug/L																				
1,2,4-Trichlorobenzene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,2'-oxybis(1-Chloropropane)	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,4,5-Trichlorophenol	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
2,4,6-Trichlorophenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,4-Dichlorophenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,4-Dimethylphenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,4-Dinitrophenol	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
2,4-Dinitrotoluene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2,6-Dinitrotoluene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2-Chloronaphthalene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2-Chlorophenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2-Methylnaphthalene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2-Methylphenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
2-Nitroaniline	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
2-Nitrophenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
3,3'-Dichlorobenzidine	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
3-Nitroaniline	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
4,6-Dinitro-2-methylphenol	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
4-Bromophenyl-phenylether	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
4-Chloro-3-methylphenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
4-Chloroaniline	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
4-Chlorophenyl-phenylether	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
4-Methylphenol	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
4-Nitroaniline	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
4-Nitrophenol	25	U	25	U	25	U	NA		NA		25	U	25	U	25	U	25	U	NA	
Acenaphthene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	

Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101	39G00201	39G00201D	39G00202	39G00202D	39G00301	39G00301D	39G00401	39G00501	39G00601
Lab ID	MA627002	MA627003	MA627004	ABBOW*8	ABBOW*7	MA640003	MA640004	MA640005	MA640002	MA801001
Sampling Date	2-Apr-96	2-Apr-96	2-Apr-96	29-Aug-96	29-Aug-96	3-Apr-96	3-Apr-96	3-Apr-96	3-Apr-96	23-Apr-96
Acenaphthylene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Anthracene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Benzo(a)anthracene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Benzo(a)pyrene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Benzo(b)fluoranthene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Benzo(g,h,i)perylene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Benzo(k)fluoranthene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
bis(2-Chloroethyl)ether	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Butylbenzylphthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Carbazole	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Chrysene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Di-n-butylphthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	1 J	10 U	NA
Di-n-octylphthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Dibenz(a,h)anthracene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Dibenzofuran	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Diethylphthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Dimethylphthalate	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Fluoranthene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Fluorene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Hexachlorobenzene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Hexachlorobutadiene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Hexachlorocyclopentadiene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Hexachloroethane	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Isophorone	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
N-Nitroso-di-n-propylamine	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
N-Nitrosodiphenylamine (1)	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Naphthalene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Nitrobenzene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Pentachlorophenol	25 U	25 U	25 U	NA	NA	25 U	25 U	25 U	25 U	NA
Phenanthrene	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA
Phenol	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	NA

Appendix F
Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101		39G00201		39G00201D		39G00202		39G00202D		39G00301		39G00301D		39G00401		39G00501		39G00601	
Lab ID	MA627002		MA627003		MA627004		ABBOW*8		ABBOW*7		MA640003		MA640004		MA640005		MA640002		MA801001	
Sampling Date	2-Apr-96		2-Apr-96		2-Apr-96		29-Aug-96		29-Aug-96		3-Apr-96		3-Apr-96		3-Apr-96		3-Apr-96		23-Apr-96	
Pyrene	10	U	10	U	10	U	NA		NA		10	U	10	U	10	U	10	U	NA	
Pesticides/PCBs, ug/L																				
4,4'-DDD	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
4,4'-DDE	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
4,4'-DDT	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Aldrin	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
alpha-BHC	0.05	UJ	0.05	UJ	0.05	UJ	NA		NA		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	NA	
alpha-Chlordane	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Aroclor-1016	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1221	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1232	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1242	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1248	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1254	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
Aroclor-1260	0.5	U	0.5	U	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U	NA	
beta-BHC	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
delta-BHC	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Dieldrin	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Endosulfan I	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Endosulfan II	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Endosulfan sulfate	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Endrin	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Endrin aldehyde	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
Endrin ketone	0.1	U	0.1	U	0.1	U	NA		NA		0.1	U	0.1	U	0.1	U	0.1	U	NA	
gamma-BHC (Lindane)	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
gamma-Chlordane	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Heptachlor	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Heptachlor epoxide	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Methoxychlor	0.5	UJ	0.5	UJ	0.5	UJ	NA		NA		0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	NA	
Toxaphene	5	U	5	U	5	U	NA		NA		5	U	5	U	5	U	5	U	NA	
Herbicides, ug/L																				
2,4,5-T	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U
2,4,5-TP (Silvex)	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U
2,4-D	NA		NA		NA		NA		NA		NA		NA		NA		NA		2.5	U

Appendix F
Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101		39G00201		39G00201D		39G00202		39G00202D		39G00301		39G00301D		39G00401		39G00501		39G00601	
Lab ID	MA627002		MA627003		MA627004		ABBOW*8		ABBOW*7		MA640003		MA640004		MA640005		MA640002		MA801001	
Sampling Date	2-Apr-96		2-Apr-96		2-Apr-96		29-Aug-96		29-Aug-96		3-Apr-96		3-Apr-96		3-Apr-96		3-Apr-96		23-Apr-96	
2,4-DB	NA		NA		NA		NA		NA		NA		NA		NA		NA		2.5	U
2,4-DP (Dichloroprop)	NA		NA		NA		NA		NA		NA		NA		NA		NA		2.5	U
Dalapon	NA		NA		NA		NA		NA		NA		NA		NA		NA		5	U
Dicamba	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U
Dinoseb	NA		NA		NA		NA		NA		NA		NA		NA		NA		0.5	U
MCPA	NA		NA		NA		NA		NA		NA		NA		NA		NA		250	U
MCPP	NA		NA		NA		NA		NA		NA		NA		NA		NA		250	U
Explosives, ug/L																				
1,3,5-Trinitrobenzene	0.04	U	0.04	U	0.04	U	NA		NA		0.04	U	0.04	U	0.04	U	0.04	U	NA	
1,3-Dinitrobenzene	0.04	U	0.04	U	0.04	U	NA		NA		0.04	U	0.04	U	0.04	U	0.04	U	NA	
2,4,6-Trinitrotoluene	0.04	U	0.04	U	0.04	U	NA		NA		0.07		0.04	U	0.04	U	0.04	U	NA	
2-Amino-4,6-Dinitrotoluene	0.04	U	0.04	U	0.04	U	NA		NA		0.04	U	0.04	U	0.04	U	0.04	U	NA	
2-Nitrotoluene	0.08	U	0.08	U	0.08	U	NA		NA		0.08	U	0.08	U	0.08	U	0.08	U	NA	
3-Nitrotoluene	0.09	U	0.09	U	0.09	U	NA		NA		0.09	U	0.09	U	0.09	U	0.09	U	NA	
4-Amino-2,6-Dinitrotoluene	0.04	U	0.04	U	0.04	U	NA		NA		0.04	U	0.04	U	0.04	U	0.04	U	NA	
4-Nitrotoluene	0.09	U	0.09	U	0.09	U	NA		NA		0.09	U	0.09	U	0.09	U	0.09	U	NA	
HMX	0.09	U	0.09	U	0.09	U	NA		NA		0.09	U	0.09	U	0.09	U	0.09	U	NA	
RDX	0.09	U	0.09	U	0.09	U	NA		NA		0.09	U	0.09	U	0.09	U	0.09	U	NA	
Tetryl (total)	0.05	U	0.05	U	0.05	U	NA		NA		0.05	U	0.05	U	0.05	U	0.05	U	NA	
Inorganics, ug/L																				
Aluminum	1750	J	1550	J	1550	J	NA		NA		257	J	273	J	1160	J	365	J	NA	
Antimony	1.6	B	1.1	U	2.7	U	NA		NA		2.6	U	2.2	U	1.8	U	1.1	U	NA	
Arsenic	1.3	U	3.9	B	3	B	NA		NA		1.3	U	1.3	U	1.3	U	1.3	U	NA	
Barium	20.5	U	30.5	U	53.8	J	NA		NA		2.9	U	3.1	U	9.6	U	3.8	U	NA	
Beryllium	0.2	U	0.2	U	0.2	U	NA		NA		0.2	U	0.2	U	0.2	U	0.2	U	NA	
Cadmium	1.8	UJ	1.8	UJ	1.8	UJ	NA		NA		1.8	UJ	1.8	UJ	1.8	UJ	1.8	UJ	NA	
Calcium	30800		132000		135000		NA		NA		50600		50700		13200		50400		NA	
Chromium	5.1	U	2.2	U	2.2	U	NA		NA		2.2	U	2.5	U	4.6	U	2.2	U	NA	
Cobalt	1.5	U	22.2	B	21.7	B	NA		NA		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Copper	3.8	J	2	UJ	2	UJ	NA		NA		2	UJ	2	UJ	2	UJ	2.3	J	NA	
Iron	75.4	U	1320	J	1220	J	NA		NA		22.4	U	28.7	U	94.8	U	269	J	NA	
Lead	1.2	UJ	1.2	UJ	1.2	UJ	NA		NA		1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ	NA	
Magnesium	1200	B	819	B	838	B	NA		NA		2170	B	2170	B	1190	B	2040	B	NA	
Manganese	2.5	U	13.3	J	13.5	J	NA		NA		1.4	U	1.6	U	2.2	U	2.5	U	NA	
Mercury	0.24	J	0.1	UJ	0.1	U	NA		NA		0.1	UJ	0.1	U	0.17	J	0.1	UJ	NA	

Appendix F

Table F-6. Summary of Groundwater Analytical Results
Study Area 39 - Target Analyte List and Target Compound List Analyses

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00101	39G00201	39G00201D	39G00202	39G00202D	39G00301	39G00301D	39G00401	39G00501	39G00601
Lab ID	MA627002	MA627003	MA627004	ABBOW*8	ABBOW*7	MA640003	MA640004	MA640005	MA640002	MA801001
Sampling Date	2-Apr-96	2-Apr-96	2-Apr-96	29-Aug-96	29-Aug-96	3-Apr-96	3-Apr-96	3-Apr-96	3-Apr-96	23-Apr-96
Nickel	7.7 U	12.5 B	12.2 B	NA	NA	7.7 U	7.7 U	7.7 U	7.7 U	NA
Potassium	998 B	2470 B	2000 B	NA	NA	7080	7340	3070 B	3850 B	NA
Selenium	1.3 U	1.3 U	1.3 U	NA	NA	1.3 U	1.3 U	1.3 U	1.4 B	NA
Silver	2.2 UJ	2.2 UJ	2.2 UJ	NA	NA	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	NA
Sodium	1040 J	5960 J	6020 J	NA	NA	4300 BJ	4310 BJ	2310 J	4230 J	NA
Thallium	0.86 U	0.86 UJ	0.86 UJ	NA	NA	0.86 UJ	0.86 UJ	0.86 U	0.86 U	NA
Vanadium	5 B	1.9 B	1.6 U	NA	NA	5.3 B	5.4 B	7 B	2.4 B	NA
Zinc	4 U	85.5 J	88.1 J	NA	NA	5.2 U	3.4 U	5.7 U	5.9 U	NA
Radiological, pCi/L										
Gross Alpha	6.57	33.3	38.5	7.17	6.27	4.69	0.85	11.5	1.43	NA
Gross Alpha, Uncertainty	NA	NA	NA	1.11	1.02	NA	NA	NA	NA	NA
Gross Beta	7.53	40.6	39.3	10.5	10.4	12.5	10.2	15.8	5.51	NA
Gross Beta, Uncertainty	NA	NA	NA	1.32	1.34	NA	NA	NA	NA	NA
Lead-210	NA	NA	NA	-0.01	-0.2	NA	NA	NA	NA	NA
Lead-210, Uncertainty	NA	NA	NA	0.35	0.34	NA	NA	NA	NA	NA
Polonium-210	NA	NA	NA	0.16	0.18	NA	NA	NA	NA	NA
Polonium-210, Uncertainty	NA	NA	NA	0.04	0.07	NA	NA	NA	NA	NA
Potassium-40	NA	NA	NA	-20.5	-24.7	NA	NA	NA	NA	NA
Potassium-40, Uncertainty	NA	NA	NA	10.5	10.4	NA	NA	NA	NA	NA
Radium-226	NA	NA	NA	0.27	0.28	NA	NA	NA	NA	NA
Radium-226, Uncertainty	NA	NA	NA	0.05	0.05	NA	NA	NA	NA	NA
Thorium-228	NA	NA	NA	1.33	1.31	NA	NA	NA	NA	NA
Thorium-228, Uncertainty	NA	NA	NA	0.16	0.16	NA	NA	NA	NA	NA
Thorium-230	NA	NA	NA	0.62	0.39	NA	NA	NA	NA	NA
Thorium-230, Uncertainty	NA	NA	NA	0.08	0.06	NA	NA	NA	NA	NA
Uranium-234	NA	NA	NA	0.16	0.15	NA	NA	NA	NA	NA
Uranium-234, Uncertainty	NA	NA	NA	0.03	0.03	NA	NA	NA	NA	NA
Uranium-238	NA	NA	NA	0.11	0.09	NA	NA	NA	NA	NA
Uranium-238, Uncertainty	NA	NA	NA	0.03	0.02	NA	NA	NA	NA	NA
General Chemistry, mg/L										
Total Petroleum Hydrocarbons	0.05 U	0.05 U	0.05 U	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA
Total Suspended Solids	4 U	4 U		NA	NA	4 U		4 U	4 U	NA

TABLE F-7

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
METHOD 524.2 VOLATILE ORGANICS ANALYSIS ONLY

Appendix F
Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00302		39G00302D		39G00303		39G00402		39G00701		39G00702		39G00801		39G00901		39G01001	
Lab ID	J9601825-002		J9601825-003		C7E190111006		C7E230134002		J9601825-004		C7E190111004		J9601817-001		J9601817-002		J9601817-003	
Sampling Date	27-Nov-96		27-Nov-96		16-May-97		22-May-97		27-Nov-96		15-May-97		26-Nov-96		26-Nov-96		26-Nov-96	
Volatile Organics, ug/L																		
1,1,1,2-Tetrachloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1,1-Trichloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1-Dichloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1-Dichloroethene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,1-Dichloropropene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2,3-Trichloropropane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2-Dibromo-3-chloropropane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2-Dibromoethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2-Dichlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2-Dichloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,2-Dichloropropane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,3,5-Trimethylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,3-Dichlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,3-Dichloropropane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
1,4-Dichlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
2,2-Dichloropropane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
2-Chlorotoluene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
4-Chlorotoluene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Benzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Bromobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Bromochloromethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Bromodichloromethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Bromoform	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Bromomethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Carbon tetrachloride	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Chlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Chloroethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Chloroform	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G00302		39G00302D		39G00303		39G00402		39G00701		39G00702		39G00801		39G00901		39G01001	
Lab ID	J9601825-002		J9601825-003		C7E190111006		C7E230134002		J9601825-004		C7E190111004		J9601817-001		J9601817-002		J9601817-003	
Sampling Date	27-Nov-96		27-Nov-96		16-May-97		22-May-97		27-Nov-96		15-May-97		26-Nov-96		26-Nov-96		26-Nov-96	
Chloromethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Dibromochloromethane	NA		NA		0.5	U	0.5	U	NA		0.5	U	NA		NA		NA	
Dibromomethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Dichlorodifluoromethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Ethylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Isopropylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Methylene chloride	5	U	5	U	0.5	U	0.5	U	5	U	0.5	U	5	U	5	U	5	U
n-Butylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
n-Propylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
p-Isopropyltoluene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
sec-Butylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Styrene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
tert-Butylbenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Tetrachloroethene	15		14		8.6		0.5	U	12		11		22		36		3	
Toluene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Trichloroethene	1	U	1	U	0.5	U	0.5	U	1	U	0.23	J	2		1	U	1	U
Trichlorofluoromethane	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Vinyl chloride	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Xylene (total)	3	U	3	U	0.5	U	0.5	U	3	U	0.5	U	3	U	3	U	3	U
1,2,4-Trichlorobenzene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Hexachlorobutadiene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U
Naphthalene	1	U	1	U	0.5	U	0.5	U	1	U	0.5	U	1	U	1	U	1	U

Appendix F
Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G01101		39G01201		39G01301		39G01401		39G01501		39G01601		39G01701		39G01701D	
Lab ID	J9601817-005		C7E150129001		C7E150129002		C7E150129003		C7E230134003		C7E230134004		C7E220159003		C7E220159004	
Sampling Date	26-Nov-96		13-May-97		13-May-97		14-May-97		22-May-97		22-May-97		21-May-97		21-May-97	
Volatile Organics, ug/L																
1,1,1,2-Tetrachloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trimethylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromo-3-chloropropane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromoethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3,5-Trimethylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2,2-Dichloropropane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Chlorotoluene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
4-Chlorotoluene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	1	U	0.5	U	0.5	U	0.1	J	0.28	J	0.22	J	0.5	U	0.5	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G01101		39G01201		39G01301		39G01401		39G01501		39G01601		39G01701		39G01701D	
Lab ID	J9601817-005		C7E150129001		C7E150129002		C7E150129003		C7E230134003		C7E230134004		C7E220159003		C7E220159004	
Sampling Date	26-Nov-96		13-May-97		13-May-97		14-May-97		22-May-97		22-May-97		21-May-97		21-May-97	
Chloromethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	NA		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Isopropylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Butylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
p-Isopropyltoluene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
sec-Butylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
tert-Butylbenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	2		0.5	U	0.5	U	0.5	U	1.6		12		0.78		0.89	
Toluene	1		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	1	U	0.5	U	0.5	U	0.5	U	0.21	J	0.65		0.5	U	0.5	U
Trichlorofluoromethane	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Xylene (total)	3	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	1	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G01801		39G01901		39G02001		39G02101		39G02201		39G02201D		39G02301		39G02401	
Lab ID	C7E230134001		C7E230134006		C7E220159001		C7E200128003		C7E200128001		C7E200128002		C7E150129004		C7E190111001	
Sampling Date	21-May-97		22-May-97		21-May-97		19-May-97		19-May-97		19-May-97		14-May-97		14-May-97	
Volatile Organics, ug/L																
1,1,1,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1,1-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1,2-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,1-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2,3-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2,3-Trichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2,4-Trimethylbenzene	0.5	U	1.9		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2-Dibromo-3-chloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2-Dibromoethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,3,5-Trimethylbenzene	0.5	U	1.9		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,3-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,3-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,4-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
2,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
2-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
4-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Benzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Bromobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Bromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Bromodichloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Bromoform	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Bromomethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Chlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Chloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Chloroform	0.5	U	0.38	J	0.5	U	0.5	U	0.5	U	0.11	J	0.5	U	1	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39G01801		39G01901		39G02001		39G02101		39G02201		39G02201D		39G02301		39G02401	
Lab ID	C7E230134001		C7E230134006		C7E220159001		C7E200128003		C7E200128001		C7E200128002		C7E150129004		C7E190111001	
Sampling Date	21-May-97		22-May-97		21-May-97		19-May-97		19-May-97		19-May-97		14-May-97		14-May-97	
Chloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
cis-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Dibromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Dibromomethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Dichlorodifluoromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Ethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Isopropylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Methylene chloride	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
n-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
n-Propylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
p-Isopropyltoluene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
sec-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Styrene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
tert-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Tetrachloroethene	9.3		27		0.5	U	1.3		0.44	J	0.46	J	0.5	U	1	U
Toluene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
trans-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Trichloroethene	0.47	J	0.64		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Trichlorofluoromethane	0.5	U	3		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Vinyl chloride	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Xylene (total)	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
1,2,4-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Hexachlorobutadiene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U
Naphthalene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results

Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando

Orlando, FL

Sample ID	39G02501		39G02601		39Q00104		39Q00108		39Q00203		39Q00404		39Q01203		39Q01203D	
Lab ID	C7E190111002		C7E190111003		C7C200110003		C7C280112002		C7C200110004		C7C280112003		C7D010135003		C7D010135004	
Sampling Date	15-May-97		15-May-97		18-Mar-97		26-Mar-97		18-Mar-97		26-Mar-97		29-Mar-97		29-Mar-97	
Volatile Organics, ug/L																
1,1,1,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1,1-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1,2-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,1-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2,3-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2,3-Trichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2,4-Trimethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2-Dibromo-3-chloropropane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2-Dibromoethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,3,5-Trimethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,3-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,3-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,4-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
2,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
2-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
4-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Benzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Bromobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Bromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Bromodichloromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Bromoform	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Bromomethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Chlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Chloroethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Chloroform	0.2	J	0.65		0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results

Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando

Orlando, FL

Sample ID	39G02501		39G02601		39Q00104		39Q00108		39Q00203		39Q00404		39Q01203		39Q01203D	
Lab ID	C7E190111002		C7E190111003		C7C200110003		C7C280112002		C7C200110004		C7C280112003		C7D010135003		C7D010135004	
Sampling Date	15-May-97		15-May-97		18-Mar-97		26-Mar-97		18-Mar-97		26-Mar-97		29-Mar-97		29-Mar-97	
Chloromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
cis-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Dibromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Dibromomethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Dichlorodifluoromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Ethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Isopropylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Methylene chloride	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
n-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
n-Propylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
p-Isopropyltoluene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
sec-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Styrene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
tert-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Tetrachloroethene	0.5	U	0.5	U	0.92		0.2	J	48		0.5	U	41		33	
Toluene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
trans-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Trichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	1.1	J	0.5	U	0.76	J	0.68	J
Trichlorofluoromethane	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Vinyl chloride	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Xylene (total)	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
1,2,4-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Hexachlorobutadiene	0.5	U	0.5	U	0.1	J	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U
Naphthalene	0.5	U	0.5	U	0.5	U	0.5	U	1.2	U	0.5	U	0.84	U	0.84	U

Appendix F
Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39Q01302		39Q01404		39Q01405		39Q01604		39Q02001		39Q02002		39Q02003		39Q02004	
Lab ID	C7D010135002		C7D020110001		C7D020110002		C7D020110003		C7D040105001		C7D040105002		C7D040105003		C7D040105004	
Sampling Date	29-Mar-97		31-Mar-97		31-Mar-97		31-Mar-97		1-Apr-97		1-Apr-97		1-Apr-97		2-Apr-97	
Volatile Organics, ug/L																
1,1,1,2-Tetrachloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trimethylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromo-3-chloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromoethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3,5-Trimethylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2,2-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Chlorotoluene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
4-Chlorotoluene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	0.19	J	2.5	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	U	2.2	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.5	U	5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39Q01302	39Q01404	39Q01405	39Q01604	39Q02001	39Q02002	39Q02003	39Q02004
Lab ID	C7D010135002	C7D020110001	C7D020110002	C7D020110003	C7D040105001	C7D040105002	C7D040105003	C7D040105004
Sampling Date	29-Mar-97	31-Mar-97	31-Mar-97	31-Mar-97	1-Apr-97	1-Apr-97	1-Apr-97	2-Apr-97
Chloromethane	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Butylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Propylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
p-Isopropyltoluene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tert-Butylbenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	6.2	260	2.2	14	0.5 U	0.5 U	6.4	11
Toluene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.63
trans-1,2-Dichloroethene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.28 J	2.6 J	0.5 U	0.17 J	0.5 U	0.5 U	0.1 J	0.18 J
Trichlorofluoromethane	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene (total)	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Appendix F
Table F-7. Summary of Groundwater Analytical Results
Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando
Orlando, FL

Sample ID	39Q02005		39Q02006		39Q02210		39Q02210D		39Q02702	
Lab ID	C7D040105005		C7D040105006		C7D080138008		C7D080138007		C7D080138009	
Sampling Date	2-Apr-97		2-Apr-97		5-Apr-97		5-Apr-97		3-Apr-97	
Volatile Organics, ug/L										
1,1,1,2-Tetrachloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trimethylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromo-3-chloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromoethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,3,5-Trimethylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
2,2-Dichloropropane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
2-Chlorotoluene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
4-Chlorotoluene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Benzene	0.5	U	1.6	J	0.5	U	0.5	U	0.5	U
Bromobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	U	4.7	J	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Chloroethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.5	U	5	U	0.5	U	0.5	U	0.5	U

Appendix F

Table F-7. Summary of Groundwater Analytical Results

Study Area 39 - Method 524.2 Volatile Organics Analysis Only

Naval Training Center, Orlando

Orlando, FL

Sample ID	39Q02005		39Q02006		39Q02210		39Q02210D		39Q02702	
Lab ID	C7D040105005		C7D040105006		C7D080138008		C7D080138007		C7D080138009	
Sampling Date	2-Apr-97		2-Apr-97		5-Apr-97		5-Apr-97		3-Apr-97	
Chloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Isopropylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	0.5	U	5	U	0.5	U	0.5	U	0.5	U
n-Butylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
p-Isopropyltoluene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
sec-Butylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Styrene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
tert-Butylbenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	1.6		260		0.5	U	0.5	U	0.5	U
Toluene	0.5	U	4	J	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	0.5	U	4.4	J	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Xylene (total)	0.5	U	5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.5	U	5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.5	U	5	U	0.5	U	0.5	U	0.5	U

TABLE F-8

SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

Appendix F

Table F-8. Summary of Surface Water Analytical Results

Study Area 39
Naval Training Center, Orlando
Orlando, FL

Sample ID	39W00101		39W00201		39W00301		39W00401	
Lab ID	C7E270125001		C7E270125002		C7E270125003		C7E270125004	
Sampling Date	23-May-97		23-May-97		23-May-97		23-May-97	
Volatile Organics, ug/L								
1,1,1,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trimethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromo-3-chloropropane	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromoethane	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U
1,3,5-Trimethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
2,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U
2-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U
4-Chlorotoluene	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	0.5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U
Chlorodibromomethane	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.5	U	0.5	U	0.5	U	0.5	U
Isopropylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	0.5	U	0.5	U	0.5	U	0.5	U
n-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.5	U	0.5	U	0.5	U	0.5	U

Appendix F
Table F-8. Summary of Surface Water Analytical Results

Study Area 39
Naval Training Center, Orlando
Orlando, FL

Sample ID	39W00101		39W00201		39W00301		39W00401	
Lab ID	C7E270125001		C7E270125002		C7E270125003		C7E270125004	
Sampling Date	23-May-97		23-May-97		23-May-97		23-May-97	
p-Isopropyltoluene	0.5	U	0.5	U	0.5	U	0.5	U
sec-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	0.5	U	0.5	U	0.5	U	0.5	U
tert-Butylbenzene	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	0.5	U	0.5	U	0.5	U	0.5	U
Xylenes (total)	0.5	U	0.5	U	0.5	U	0.5	U

TABLE F-9

SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Appendix F
Table F-9. Summary of Sediment Analytical Results

Study Area 39
Naval Training Center, Orlando
Orlando, FL

Sample ID	39D00101		39D00201		39D00301		39D00401	
Lab ID	C7E270125007		C7E270125008		C7E270125009		C7E270125010	
Sampling Date	23-May-97		23-May-97		23-May-97		23-May-97	
Volatile Organics, ug/kg								
1,1,1-Trichloroethane	14	U	14	U	15	U	91	U
1,1,2,2-Tetrachloroethane	14	U	14	U	15	U	91	U
1,1,2-Trichloroethane	14	U	14	U	15	U	91	U
1,1-Dichloroethane	14	U	14	U	15	U	91	U
1,1-Dichloroethene	14	U	14	U	15	U	91	U
1,2-Dichloroethane	14	U	14	U	15	U	91	U
1,2-Dichloroethene (total)	14	U	14	U	15	U	91	U
1,2-Dichloropropane	14	U	14	U	15	U	91	U
2-Butanone	14	U	14	U	15	U	91	U
2-Hexanone	14	U	14	U	15	U	91	U
4-Methyl-2-pentanone	14	U	14	U	15	U	91	U
Acetone	14	U	14	U	15	U	91	U
Benzene	14	U	14	U	15	U	91	U
Bromodichloromethane	14	U	14	U	15	U	91	U
Bromoform	14	U	14	U	15	U	91	U
Bromomethane	14	U	14	U	15	U	91	U
Carbon disulfide	14	U	14	U	15	U	91	U
Carbon tetrachloride	14	U	14	U	15	U	91	U
Chlorobenzene	14	U	14	U	15	U	91	U
Chloroethane	14	U	14	U	15	U	91	U
Chloroform	14	U	14	U	15	U	91	U
Chloromethane	14	U	14	U	15	U	91	U
cis-1,3-Dichloropropene	14	U	14	U	15	U	91	U
Dibromochloromethane	14	U	14	U	15	U	91	U
Ethylbenzene	14	U	14	U	15	U	91	U
Methylene chloride	14	U	14	U	15	U	91	U
Styrene	14	U	14	U	15	U	91	U
Tetrachloroethene	14	U	14	U	15	U	91	U
Toluene	14	U	14	U	15	U	91	U
trans-1,3-Dichloropropene	14	U	14	U	15	U	91	U
Trichloroethene	14	U	14	U	15	U	91	U
Vinyl chloride	14	U	14	U	15	U	91	U
Xylenes (total)	14	U	14	U	15	U	91	U
General Analysis, percent								
Moisture	30.1		29.3		32.9		89	

APPENDIX G

EVALUATION OF PAHs AND ARSENIC IN SURFACE SOIL BY IMMUNOASSAY TESTING AND LABORATORY CONFIRMATION

TABLE G-1

PAH IMMUNOASSAY SURFACE SOIL SCREENING RESULTS

Table G-1
PAH Immunoassay Soil Screening Results

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample Identifier	Location		Optical Density Absorbance (unitless)	PAH Concentration (mg/kg)	Remarks
	Easting	Northing			
39S012	1,000	1,000	0.11	>1	
39S013	1,100	1,000	0.09	>1	Dilution 70.
39S014	1,000	1,100	0.13	0.6	
39S015	1,100	1,100	0.11	>1	
39S016	1,000	1,200	0.48	0.24	
39S017	1,100	1,200	0.32	0.51	Duplicate sample with PAH concentration of 0.65 ppm.
39S018	1,000	1,300	0.68	0.095	Duplicate sample with PAH concentration of 0.30 ppm.
39S019	1,100	1,300	0.41	0.33	
39S020	1,000	1,400	0.58	0.145	
39S021	1,100	1,400	0.66	0.1	
39S022	1,100	1,500	0.56	0.16	
39S023	1,100	1,600	0.41	0.33	
39S024	1,200	1,600	0.27	0.65	
39S025	1,300	1,600	0	>1	Dilution >100. Duplicate sample with a PAH concentration of >1 ppm.
39S026	1,200	1,500	0.29	0.59	
39S027	1,300	1,500	0.19	1	Duplicate sample with a PAH concentration of >1 ppm.
39S028	1,200	1,400	0.59	0.14	
39S029	1,300	1,400	1.21	0	
39S030	1,300	1,300	0.29	0.59	
39S031	1,200	1,300	0.22	0.85	Duplicate sample showed a PAH concentration of 0.59 ppm.
39S032	1,300	1,200	.07	>1	
39S033	1,200	1,200	0.26	0.68	
39S034	1,300	1,100	0.12	>1	Dilution 10.
39S035	1,200	1,100	0.12	>1	
39S036	1,300	1,000	0.01	>1	
39S037	1,200	1,000	0.02	>1	
39S038	1,400	1,000	0	>1	
39S039	1,500	1,000	0.01	>1	Dilution >100.
39S040	1,400	1,100	0.08	>1	Dilution >100.
39S041	1,500	1,100	0.37	0.39	
39S042	1,400	1,200	0.13	>1	Dilution >100.
39S043	1,500	1,200	0.11	>1	Dilution 28.
39S044	1,600	1,000	0.05	>1	Dilution >100.
39S045	1,600	1,100	0.47	0.27	
39S046	1,400	1,300	0.44	0.30	
39S047	1,500	1,300	0.38	0.37	
39S048	1,700	1,300	0.34	0.43	

See notes at end of table.

Table G-1 (Continued)
PAH Immunoassay Soil Screening Results

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample Identifier	Location		Optical Density Absorbance (unitless)	PAH Concentration (mg/kg)	Remarks
	Easting	Northing			
39S049	1,600	1,300	0.1	>1	Dilution >100.
39S050	1,500	1,400	0.85	0.025	
39S051	1,500	1,500	0.53	0.21	
39S052	1,500	1,600	0.48	0.26	
39S053	1,600	1,600	0.89	0.015	
39S054	1,600	1,500	0.75	0.05	
39S055	1,600	1,400	0.98	0	
39S056	1,400	1,500	0.51	0.23	
39S057	1,400	1,600	0.79	0.05	
39S058	1,700	1,400	0.42	0.30	
39S059	1,700	1,500	0.77	0.055	
39S060	1,700	1,600	0.21	0.68	

Note: All results expressed in milligrams per kilogram (mg/kg).

PAH = polynuclear aromatic hydrocarbons.
mg/kg = milligrams per kilogram.
ppm = parts per million.
> = greater than.

TABLE G-2

ANALYTICAL RESULTS FOR ARSENIC IN SURFACE SOIL AND COMPARISON OF ONSITE PAH SCREENING RESULTS USING IMMUNOASSAY VERSUS OFF-SITE CONFIRMATION RESULTS

Table G-2
Analytical Results for Arsenic in Surface Soil and Comparison of Onsite PAH Screening Results Using Immunoassay versus Off-Site Confirmation Results

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample Identifier	Arsenic Results (mg/kg)	Onsite Immunoassay Total PAH Results (mg/kg)	Off-Site Confirmation Total PAH Results (8270M) (mg/kg)	Remarks
39S018	< 1	0.1	0.2	Both > Screening Value (0.1 mg/kg)
39S025	< 1	> 1	0.27	Both > Screening Value (0.1 mg/kg)
39S027	< 1	1.00	0.42	Both > Screening Value (0.1 mg/kg)
39S029	< 1	0	0.04	Both > Screening Value (0.1 mg/kg)
39S031	< 1	0.85	0.41	Both > Screening Value (0.1 mg/kg)
39S039	< 1	> 1	1.32	Both > Screening Value (0.1 mg/kg)
39S043	2.7	> 1	2.24	Both > Screening Value (0.1 mg/kg)
39S051	< 1	0.21	0.03	False positive
39S055	< 1	0	.06	Both > Screening Value (0.1 mg/kg)
39S059	< 1	0.05	0.11	False negative
39S060	< 1	0.68	0.67	Both > Screening Value (0.1 mg/kg)

Notes All results expressed in mg/kg soil dry weight.
Correlation coefficient with immunoassay results > 1 mg/kg excluded from calculation: r = 0.65.
Gas Chromatography/Mass Spectrometry with Selective Ion Monitoring.
Screening Value is set conservatively at 0.1 mg/kg, representing Florida Department of Environmental Protection's (FDEP's) residential soil cleanup goal for carcinogenic PAH compounds, benzo(a)pyrene and dibenz(a,h)anthracene.

PAH = polynuclear aromatic hydrocarbons.
mg/kg = milligrams per kilogram.
> = less than.
< = greater than.

APPENDIX H

CONE PENETROMETER TESTING RESULTS

FUGRO GEOSCIENCES, INC. PRELIMINARY

6105 Rookin
Houston, TX 77074
Phone : 713-778-5580
Fax : 713-778-5501

May 5, 1997
Report Number 0301-7050

ABB Environmental
2590 Executive Center Circle East
Tallahassee, FL 23201

Attention: Denver Clark

**CONE PENETRATION TESTING
AND RELATED SERVICES
NAVAL TRAINING CENTER
MAIN BASE - ORLANDO
FLORIDA**

Dear Mr. Clark:

Please find enclosed herewith the preliminary results of the cone penetrometer tests conducted at the above referenced location.

For your information, the soil stratigraphy was identified using Campanella and Robertson's Simplified Soil Behavior Chart. Please note that because of the empirical nature of the soil behavior chart, the soil identification should be verified locally.

Fugro Geosciences appreciates the opportunity to be of service to your organization. If you should have any questions, or if we can be of further assistance, please do not hesitate to contact us. We look forward to working with you in the future.

Very truly yours,
FUGRO GEOSCIENCES, INC.

Recep Yilmaz
President

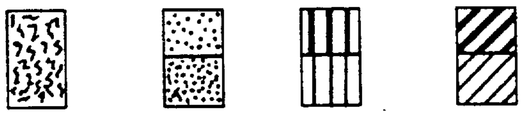
RY/mdt

Key To Soil Classification and Symbols

SOIL TYPE

(Shown in Symbol Column)

Sand Silt Clay



Fill Sandy Silty Clayey

Predominant Type Shown Heavy

SAMPLE TYPE

(Shown in Samples Column)

Undisturbed Rock Core Split Spoon No Recovery

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (Major portion Retained on No. 200 Sieve)
Includes (1) clean gravels and sand described as fine, medium or course, depending on distribution of grain sizes (2) silty or clayey gravels and sands and (3) fine grained low plasticity soils (PI < 10) such as sandy silts. Condition is rated according to relative density, as determined by lab tests or estimated from resistance to sampler penetration.

Descriptive Term	Penetration Resistance*	Relative Density
Loose	0 - 10	0 to 40%
Medium Dense	10 - 30	40 to 70%
Dense	30 - 50	70 to 90%
Very Dense	Over 50	90 to 100%

* Blows/Foot, 140# Hammer, 30" Drop

FINE GRAINED SOILS (Major Portion Passing No. 200 Sieve)
Includes (1) inorganic and organic silts and clays, (2) sandy, gravelly or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests for soils with PI $\geq$ 10.

Descriptive Term	Cohesive Shear Strength Tons/Square Foot
Very Soft	Less Than 0.125
Soft	0.125 to 0.25
Firm	0.25 to 0.50
Stiff	0.50 to 1.00
Very Stiff	1.00 to 2.00
Hard	2.00 and Higher

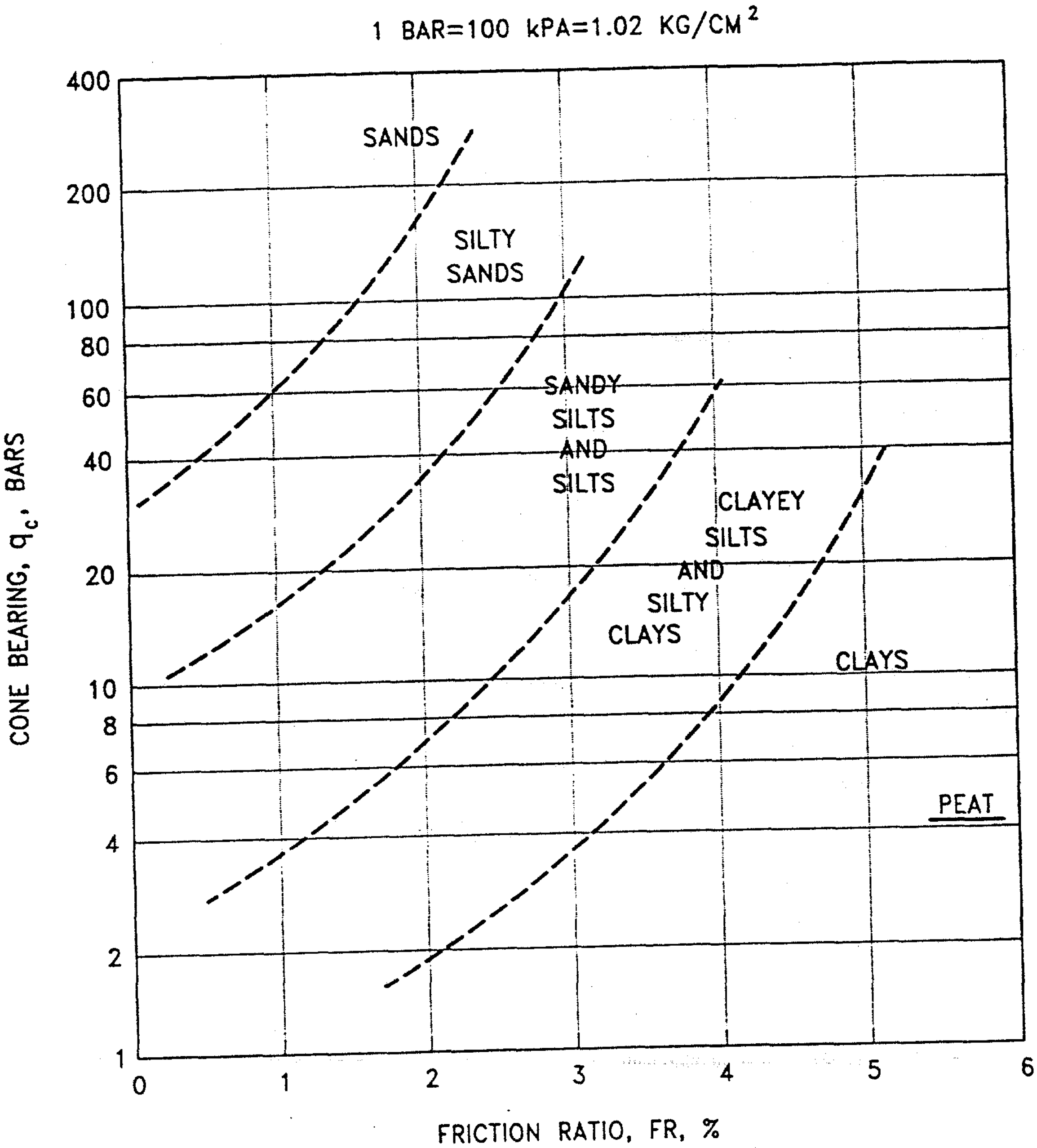
Note: Slickensided and fissured clay may have lower unconfined compressive strengths than shown above because of planes of weakness or shrinkage cracks; consistency ratings of such soils are based on hand penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

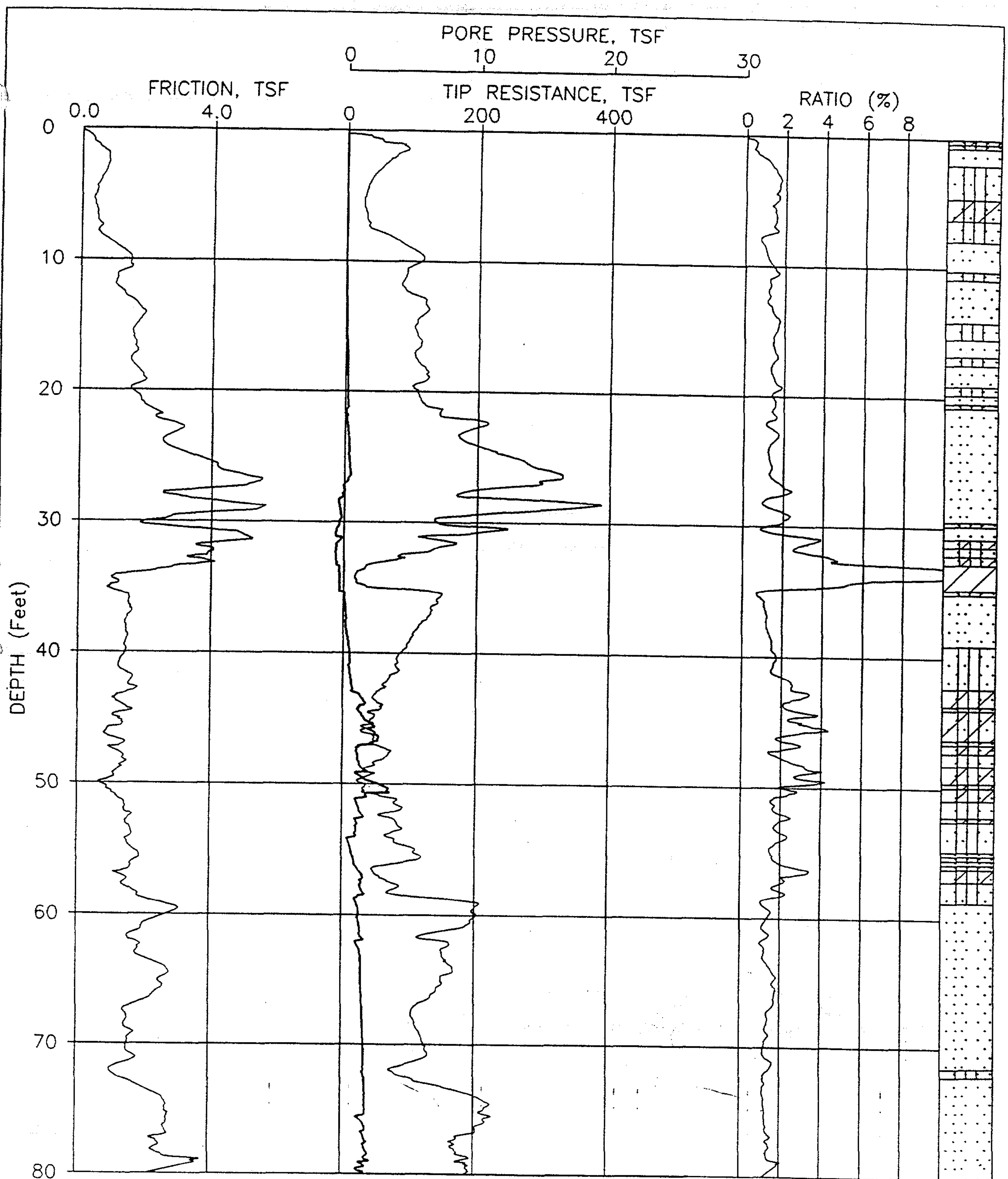
Parting:	paper thin in size
Seam:	1/8" to 3" thick
Layer:	greater than 3"
Fissured:	containing shrinkage cracks, frequently filled with fine sand or silt, usually more or less vertical
Sensitive:	pertaining to cohesive soils that are subject to appreciable loss of strength when remolded
Interbedded:	composed of alternate layers of different soil types
Laminated:	composed of thin layers of varying color and texture
Calcareous:	containing appreciable quantities of calcium carbonate
Well Graded:	having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Poorly Graded:	predominantly of one grain size, or having a range of sizes with some intermediate size missing
Flocculated:	pertaining to cohesive soils that exhibit a loose knit or flakey structure
Slickensided:	having inclined planes of weakness that are slick and glossy in appearance.

Degree of Slickensided Development

Slightly Slickensided:	slickensides present at intervals of 1' to 2', soil does not easily break along these plates
Moderately Slickensided:	slickensides spaced at intervals of 1' to 2', soil breaks easily along these planes
Extremely Slickensided:	continuous and interconnected slickensides spaced at intervals of 4" to 12", soil breaks along the slickensides into pieces 3" to 6" in size
Intensely Slickensided:	slickensides spaced at intervals of less than 4", continuous in all directions; soil breaks down along planes into nodules 1/4" to 2" in size.



CAMPANELLA AND ROBERTSON CLASSIFICATION CHART (1983)



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ELEVATION: 0.00
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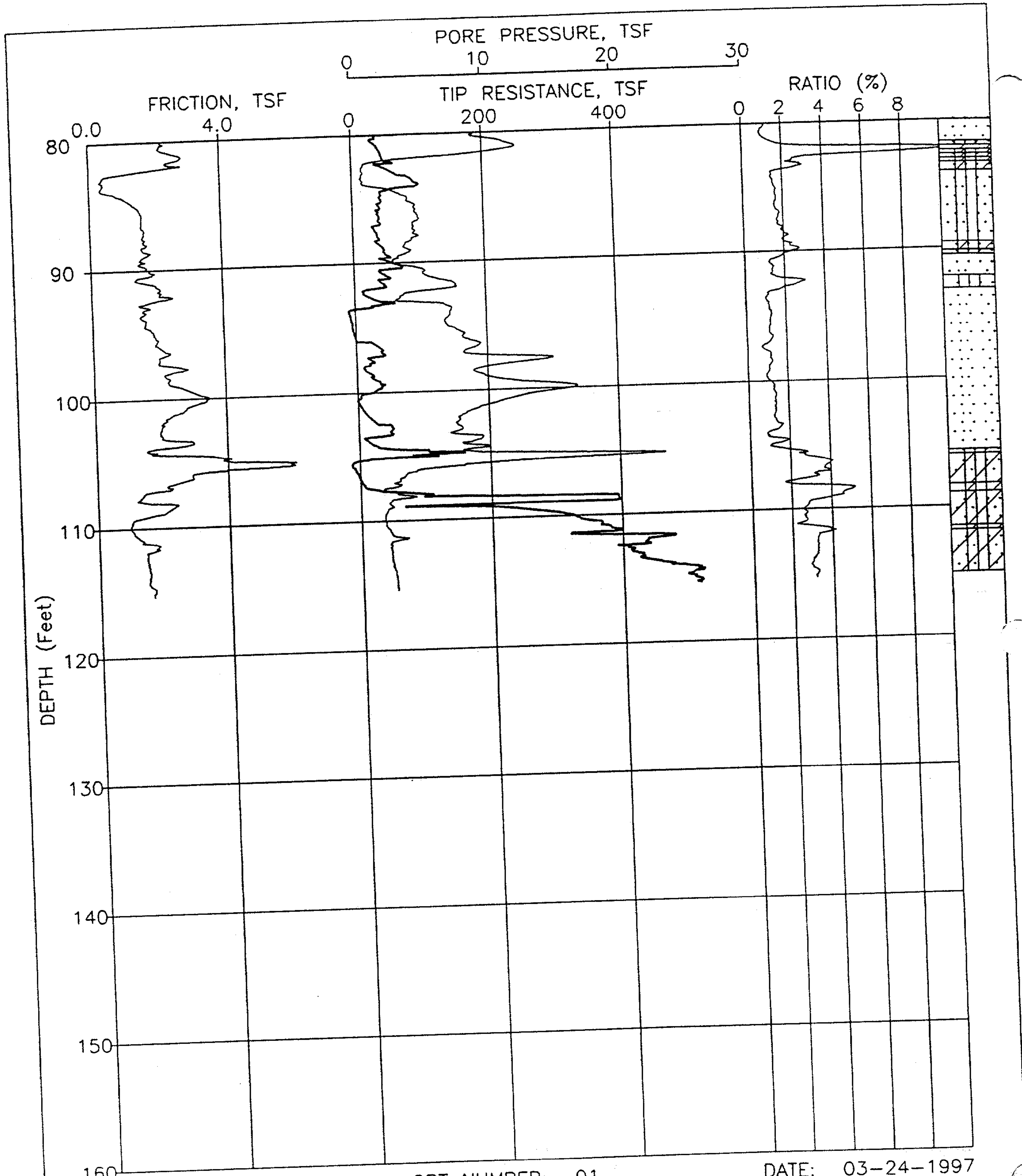
CONE NUMBER: F7.5CKEW949
DATE: 03-24-1997
PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC

DRAFT



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ELEVATION: 0.00
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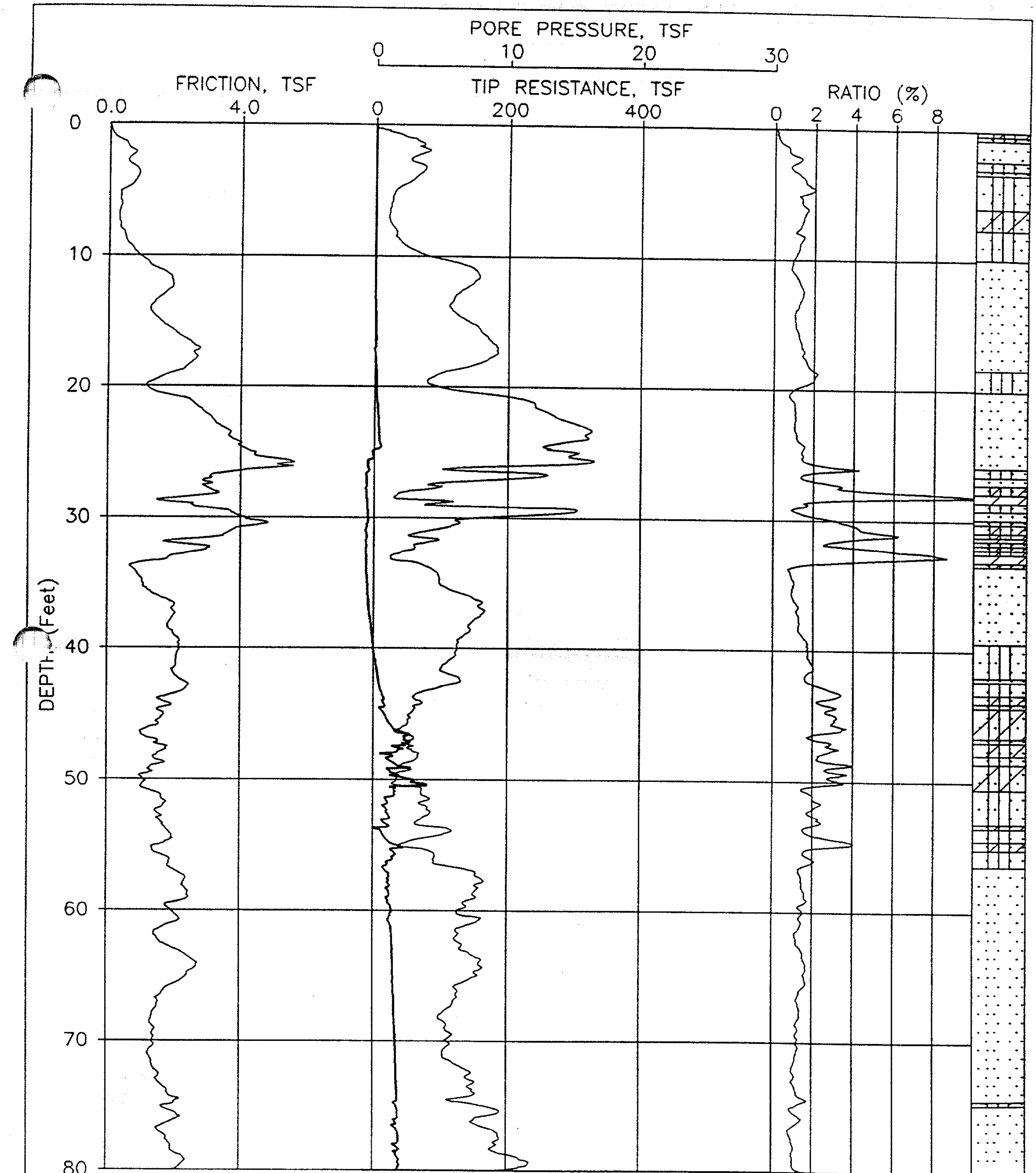
CONE NUMBER: F7.5CKEW949
DATE: 03-24-1997
PLATE: 2 OF 2

FUGRO GEOSCIENCES,INC

DRAFT



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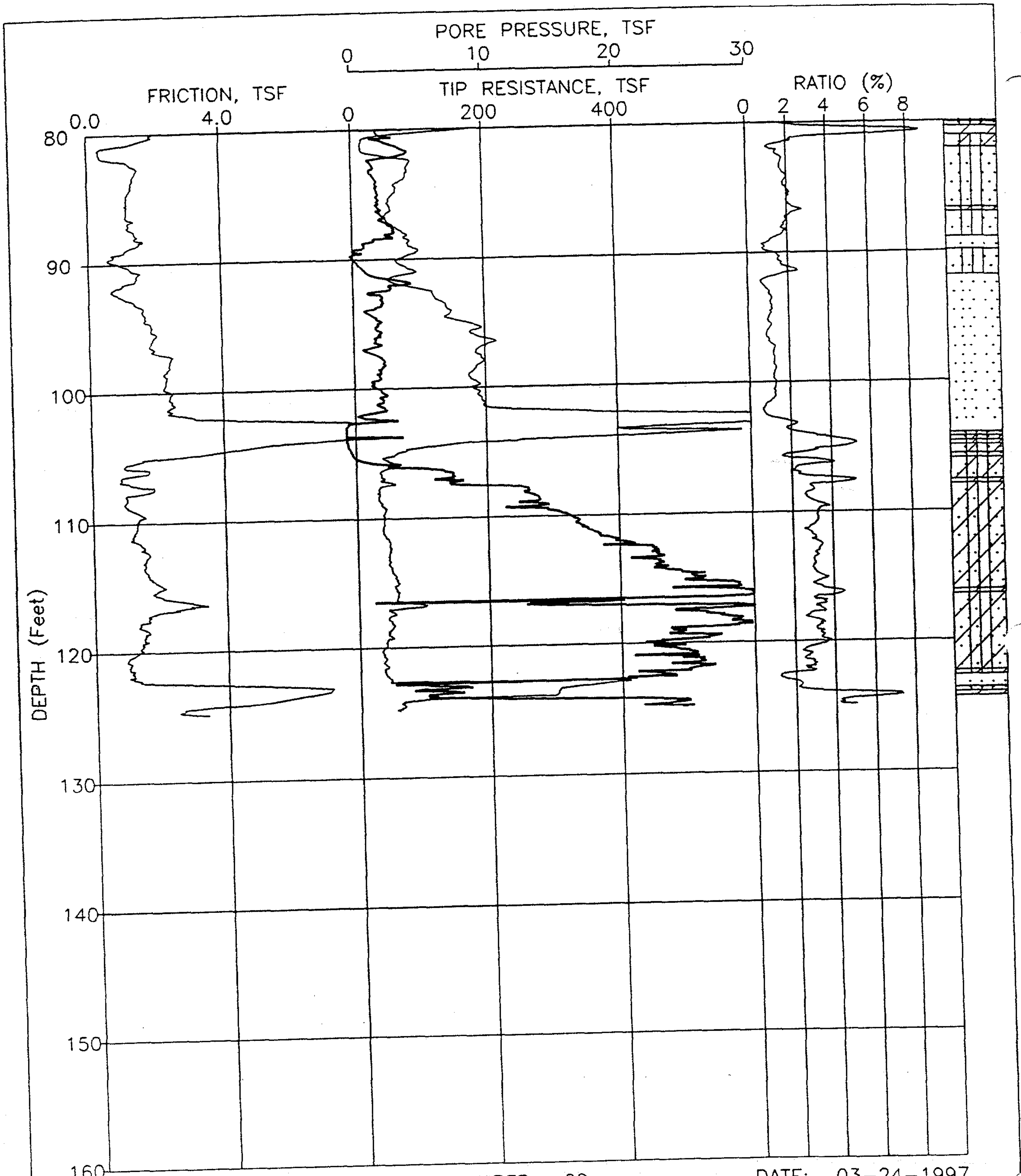
FUGRO GEOSCIENCES, INC

DRAFT



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ELEVATION: 0.00
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CONE NUMBER: F7.5CKEW949
DATE: 03-24-1997
PLATE: 2 OF 2

FUGRO GEOSCIENCES,INC

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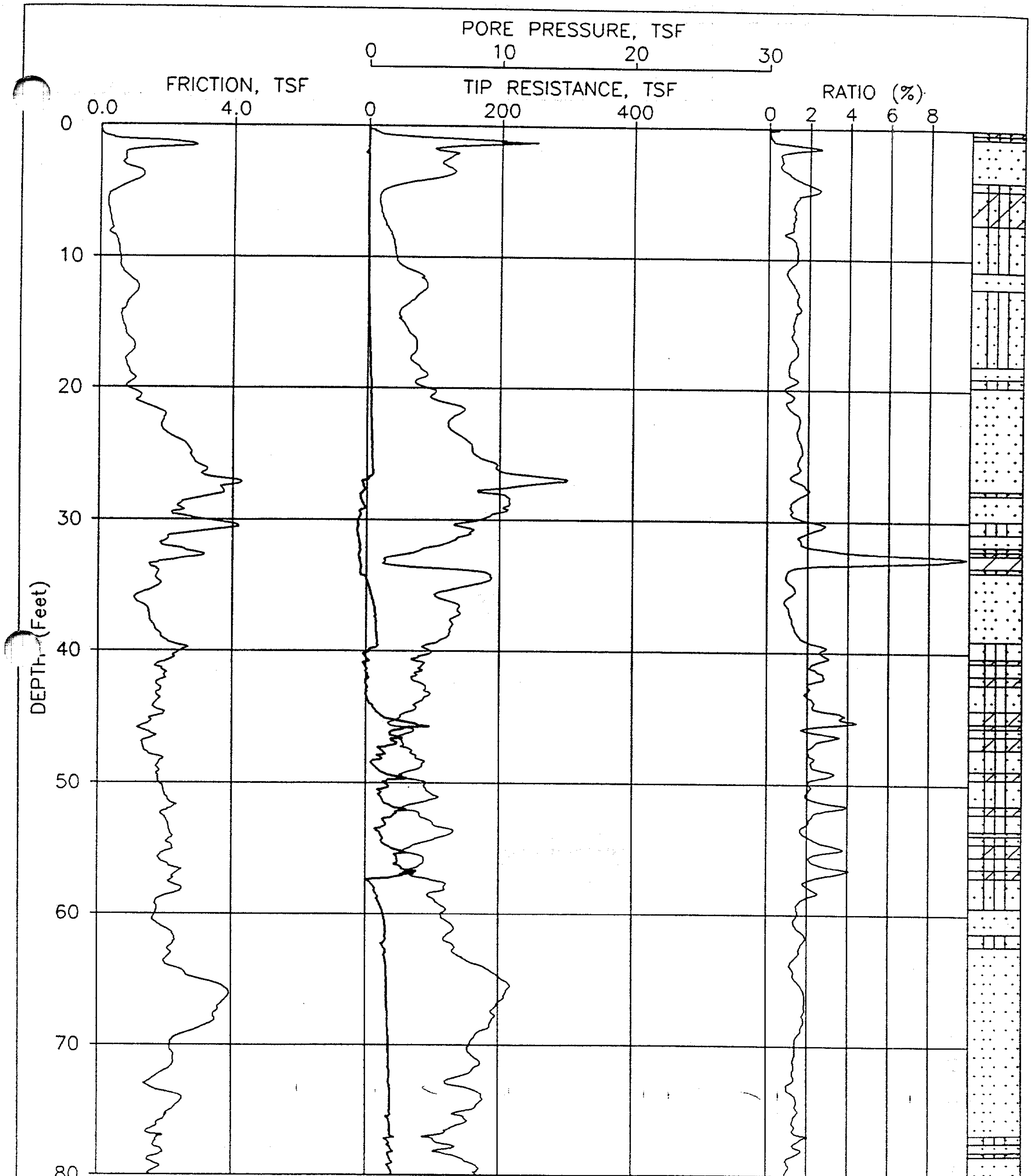

JOB NUMBER: 97-7050
ELEVATION: 0.00
CPT NUMBER: 03
CONE NUMBER: F7.5CKEW949
DATE: 03-25-1997
PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC

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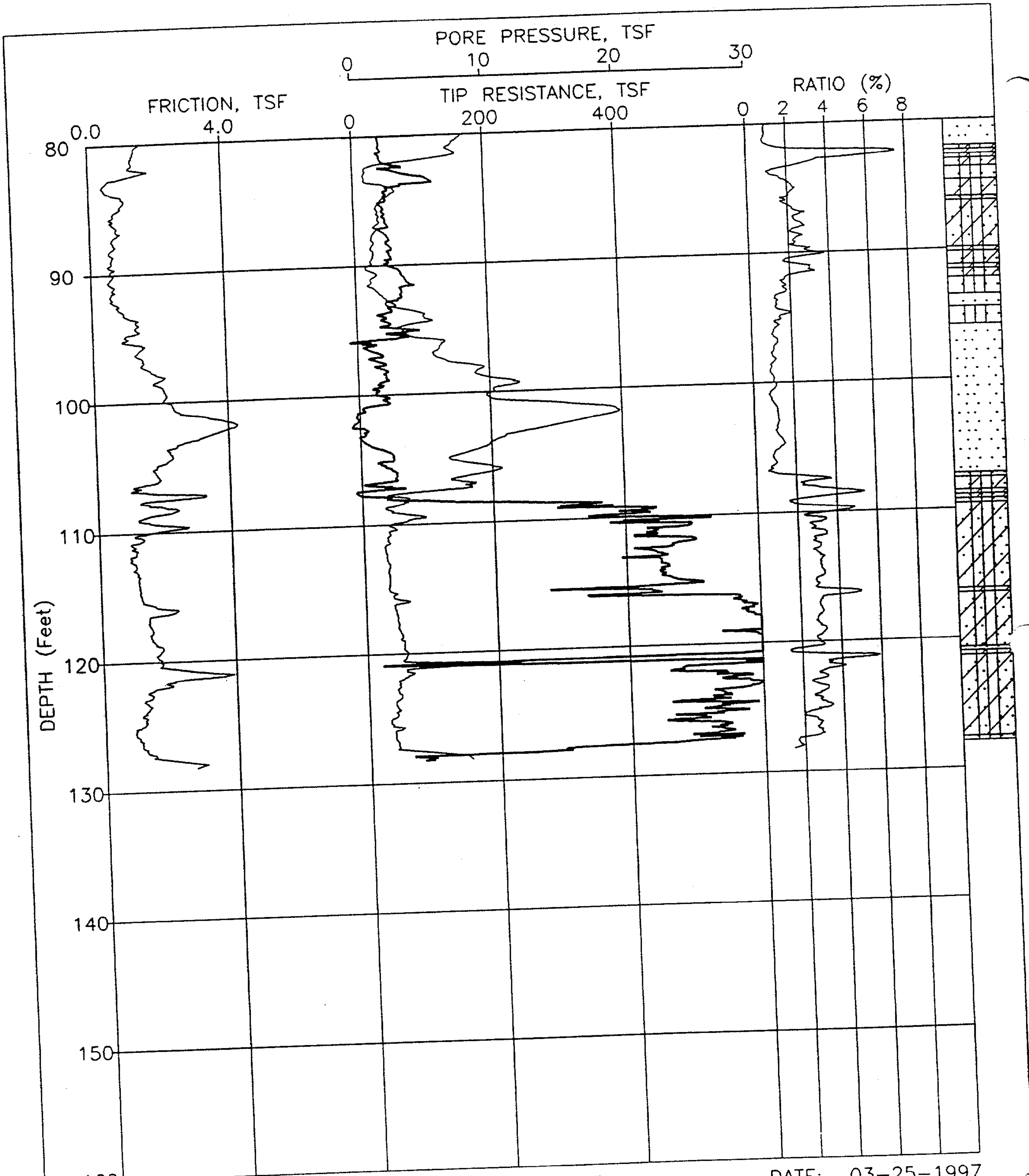

JOB NUMBER: 97–7050
ELEVATION: 0.00
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CONE NUMBER: F7.5CKEW949
DATE: 03–25–1997
PLATE: 2 OF 2

FUGRO GEOSCIENCES,INC

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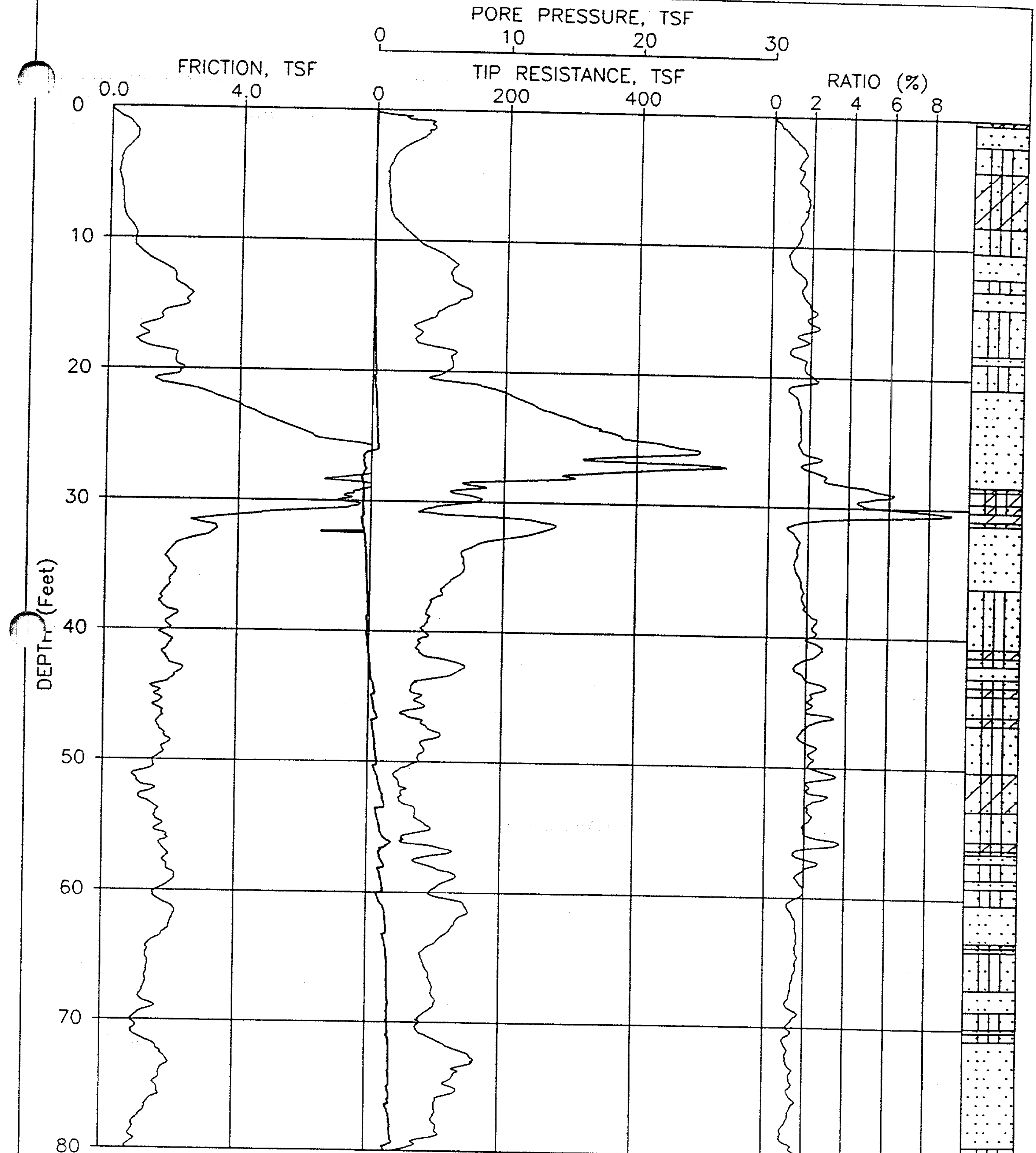

JOB NUMBER: 97-7050
ELEVATION: 0.00
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CONE NUMBER: F7.5CKEW949
DATE: 03-25-1997
PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC

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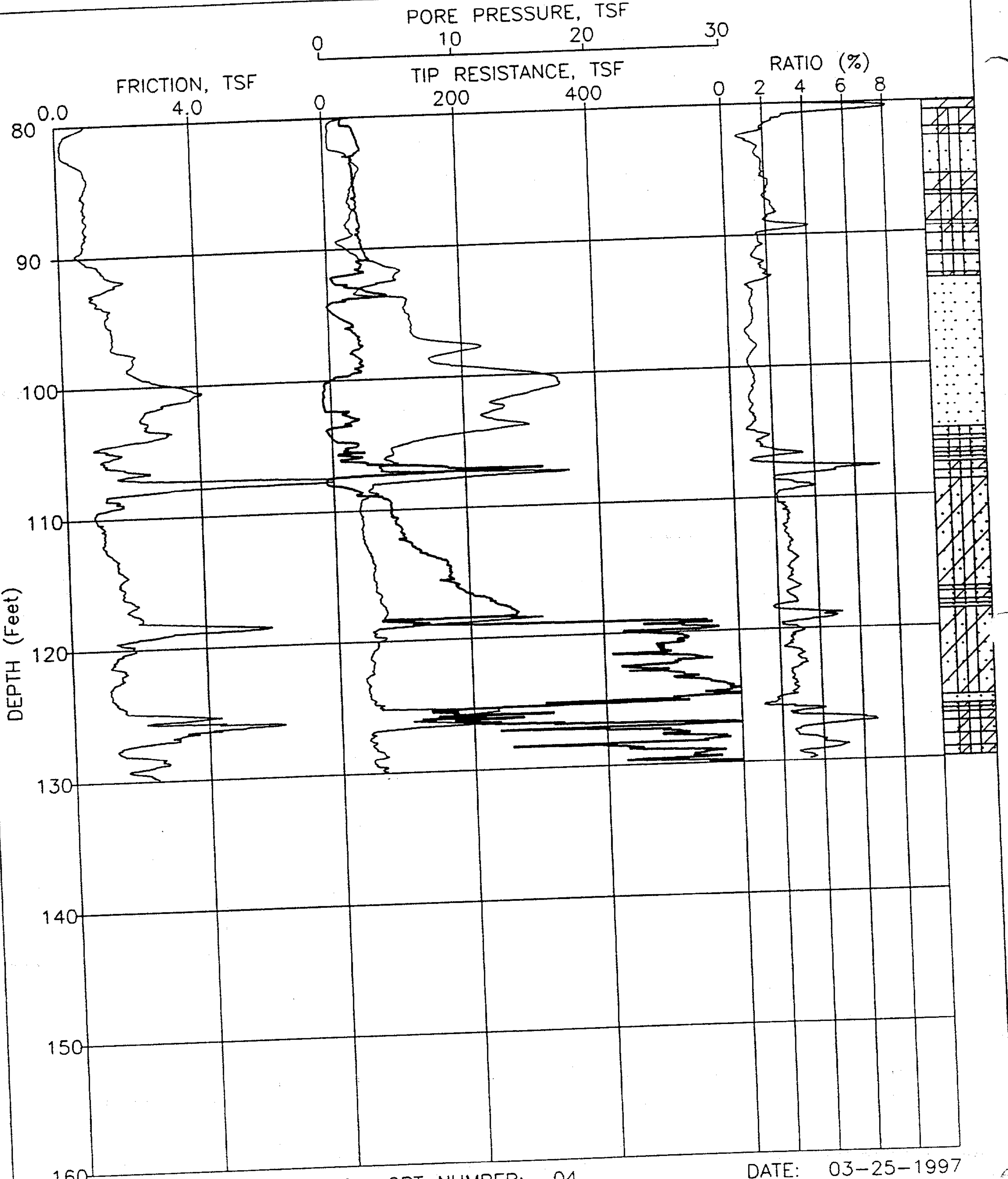

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DATE: 03-25-1997
PLATE: 2 OF 2

FUGRO GEOSCIENCES,INC

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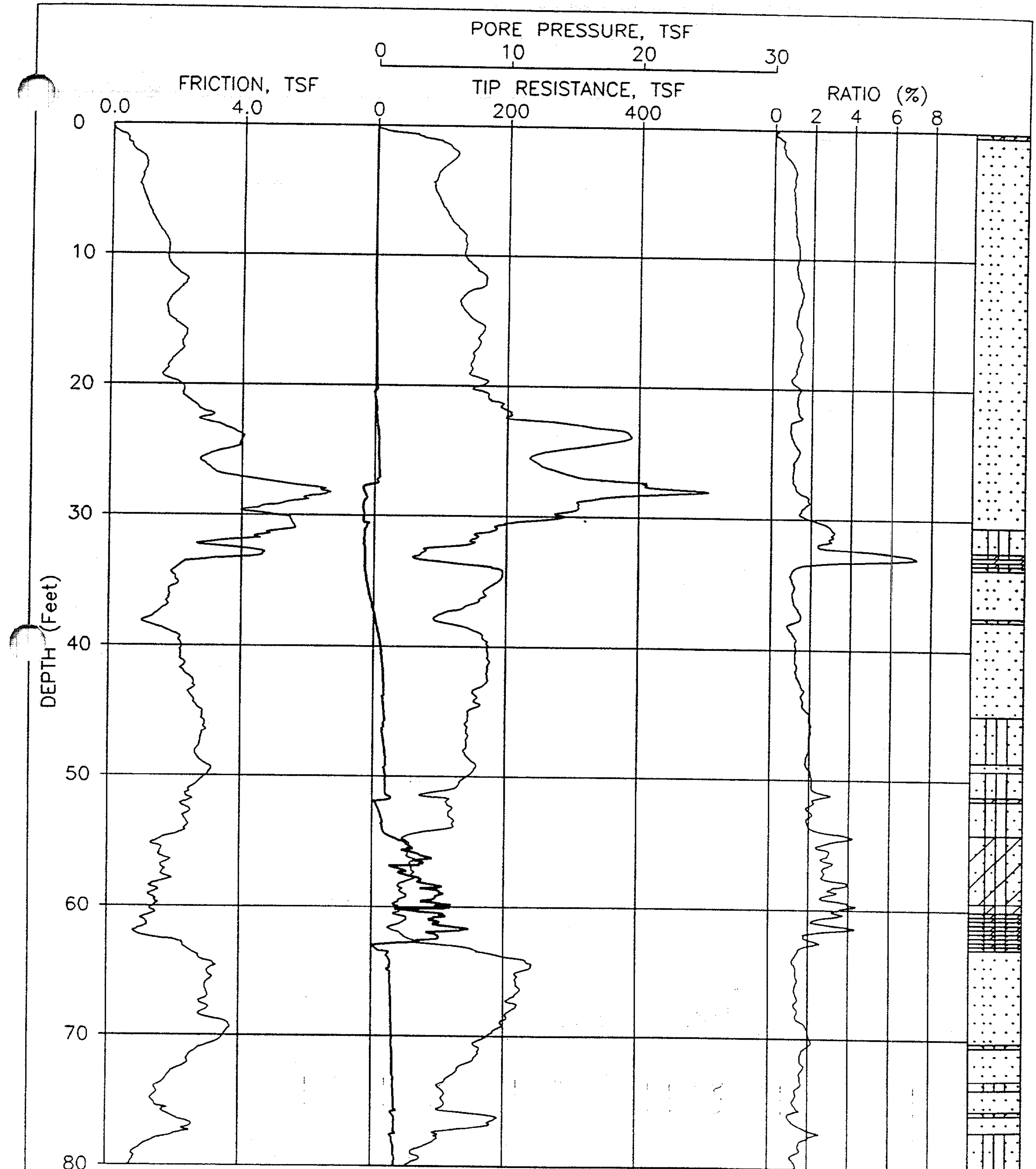

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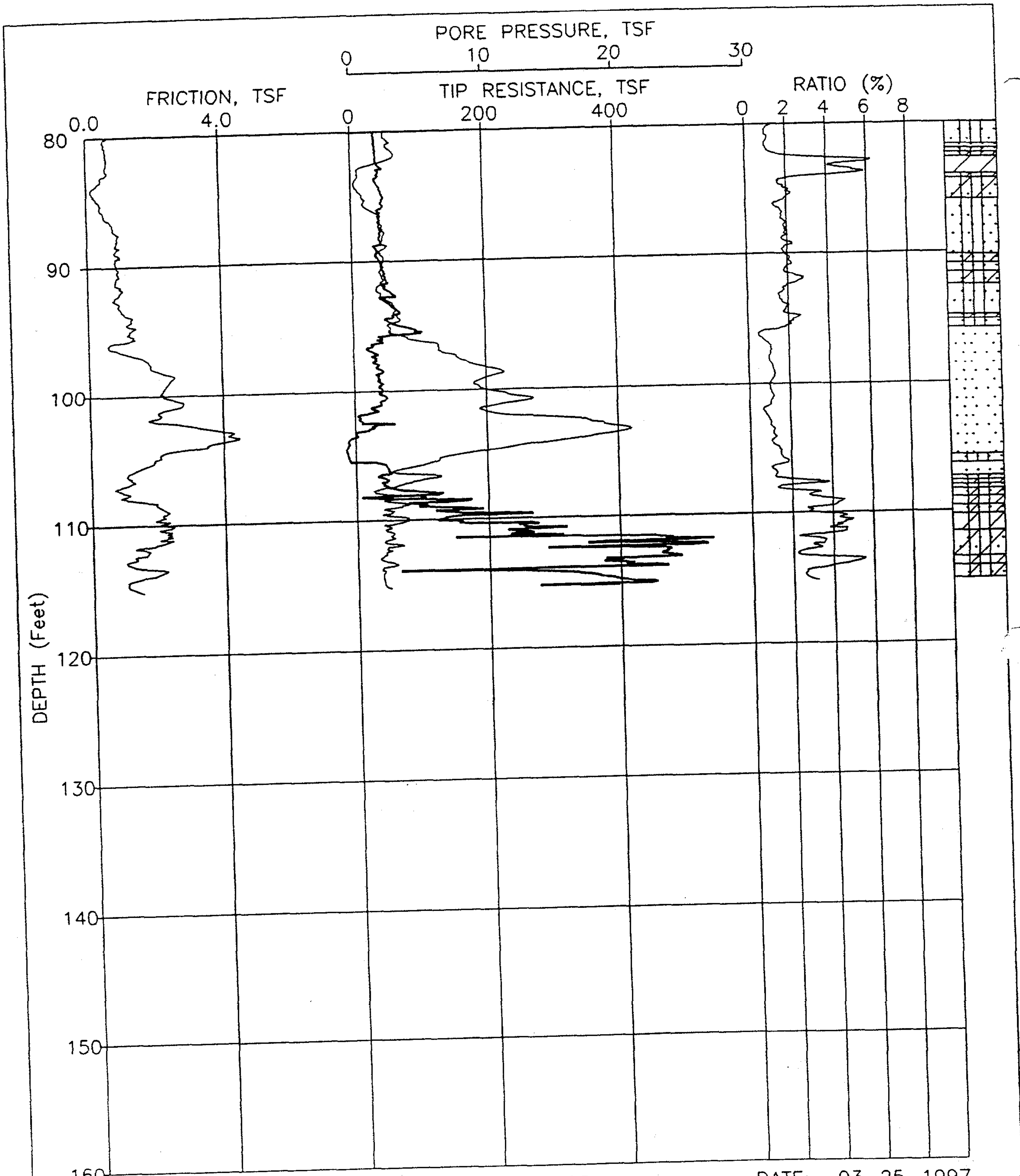
ELEVATION: 0.00 CONE NUMBER: F7.5CKEW949 PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC



JOB NUMBER: 97-7050
ELEVATION: 0.00
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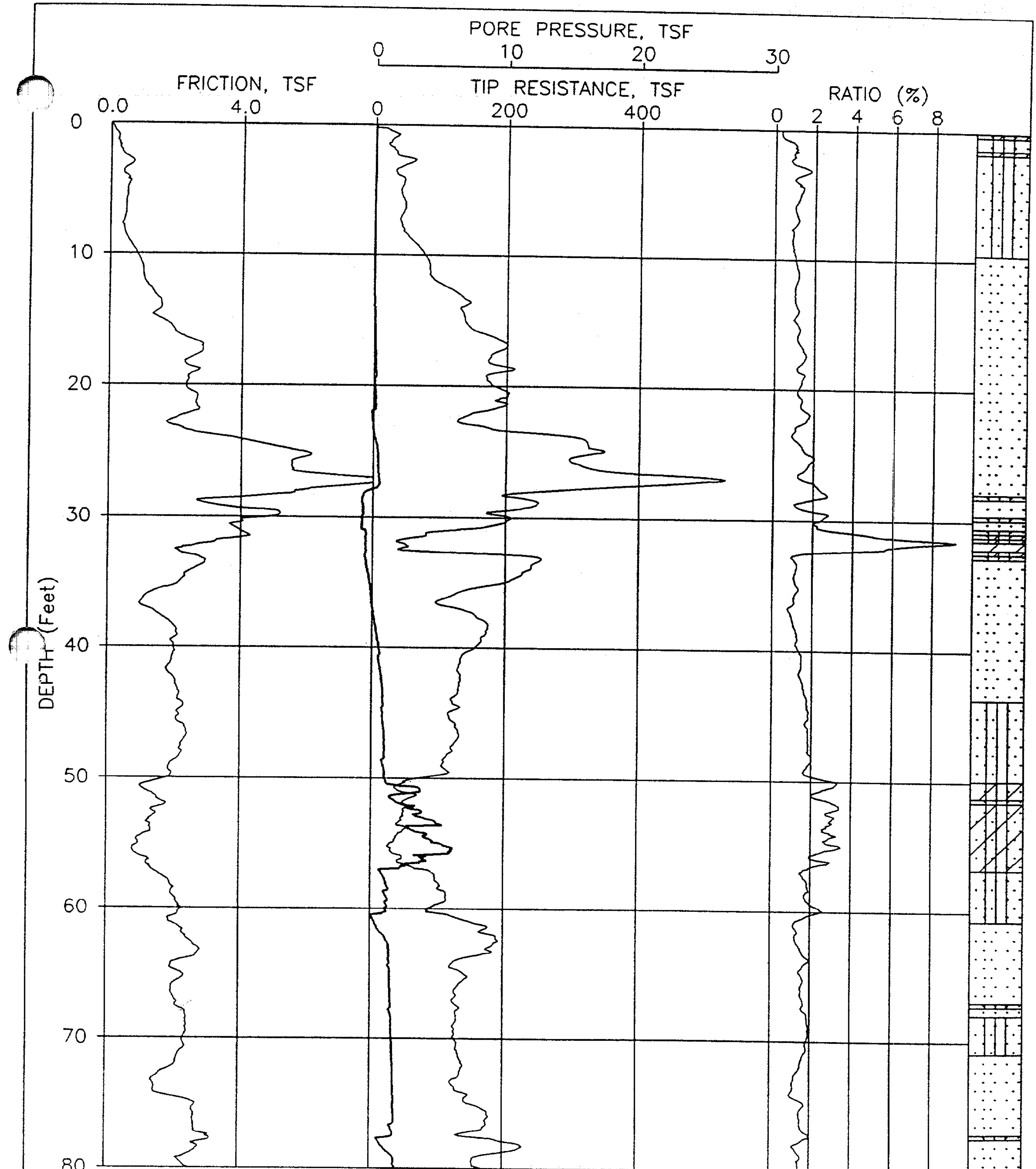
DATE: 03-25-1997
PLATE: 2 OF 2

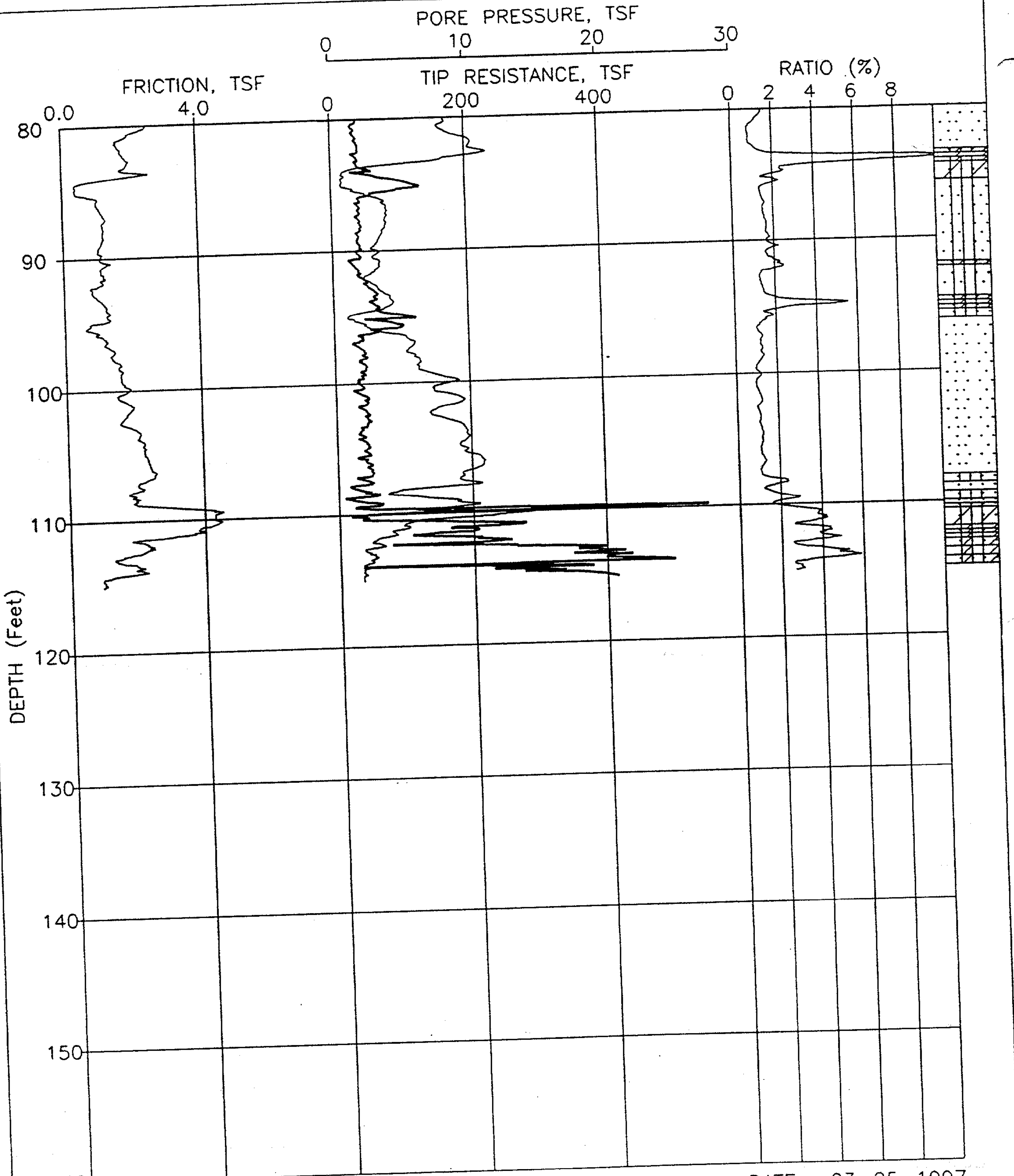
FUGRO GEOSCIENCES,INC

DRAFT



JOB NUMBER: 97-7050 CPT NUMBER: 06 DATE: 03-25-1997
ELEVATION: 0.00 CONE NUMBER: F7.5CKEW949 PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC

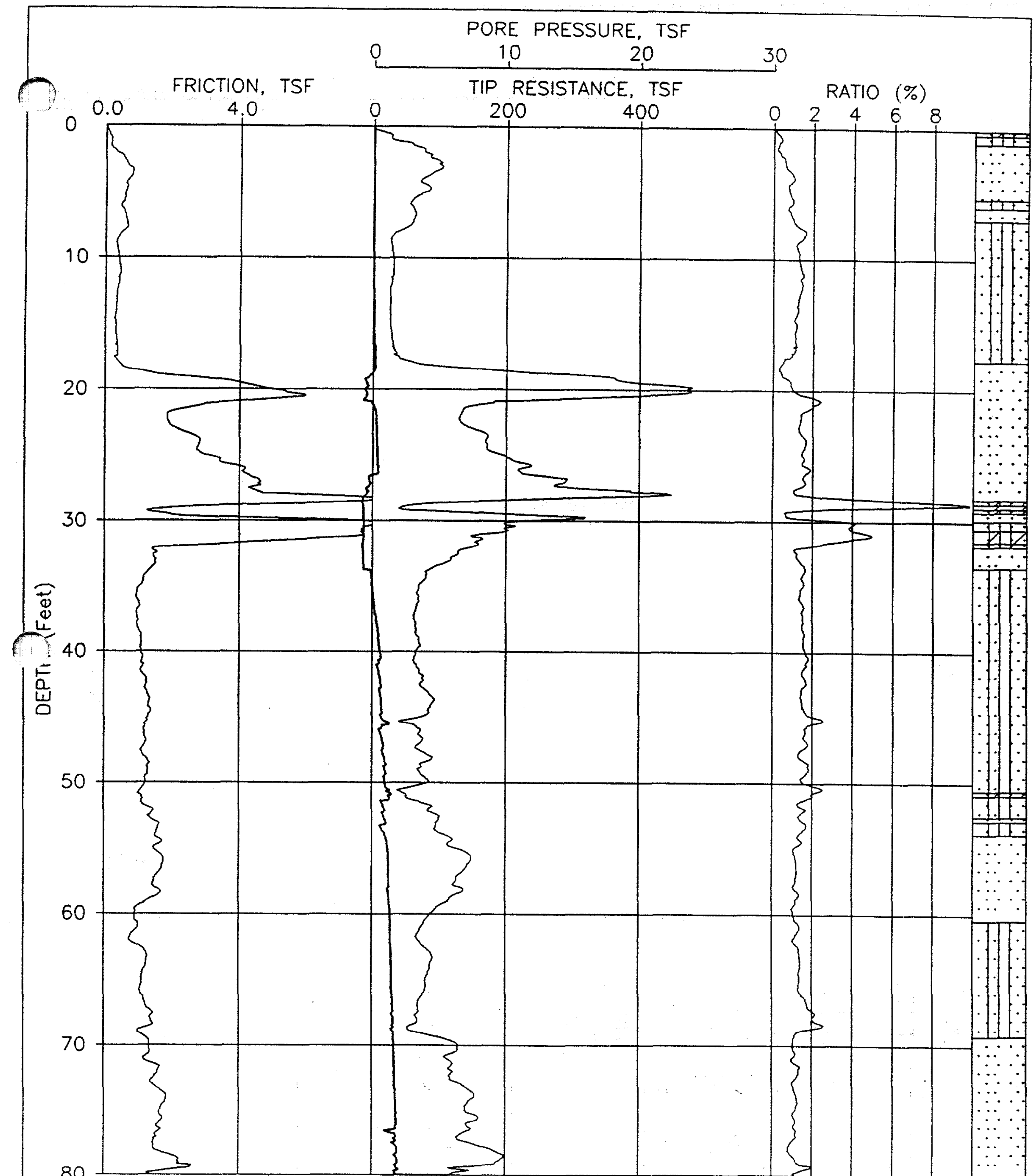


JOB NUMBER: 97-7050
ELEVATION: 0.00

CPT NUMBER: 06
CONE NUMBER: F7.5CKEW949

DATE: 03-25-1997
PLATE: 2 OF 2

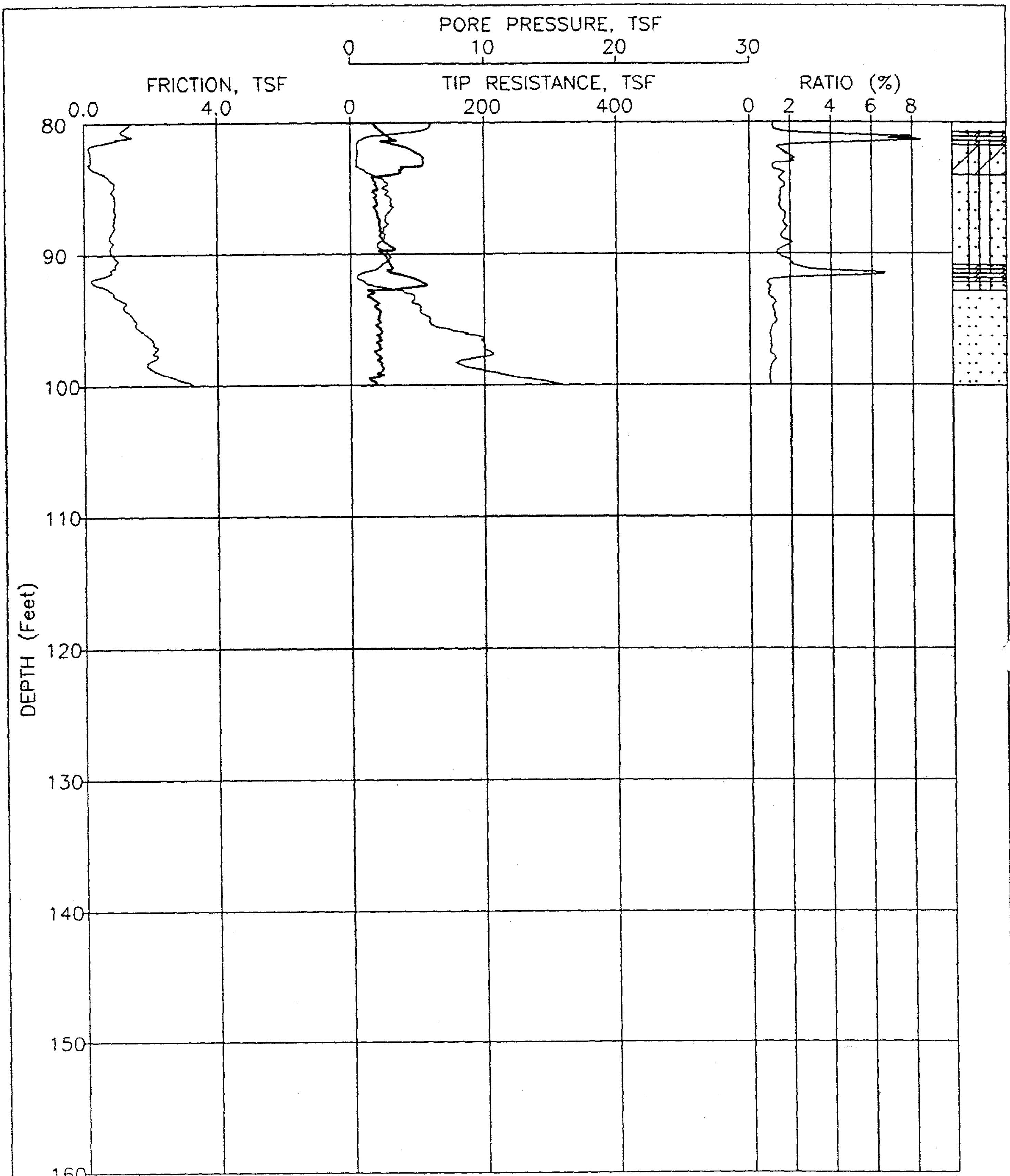
FUGRO GEOSCIENCES,INC



JOB NUMBER: 97-7050 CPT NUMBER: 07 DATE: 04-05-1997

ELEVATION: 0.00 CONE NUMBER: F7.5CKEW949 PLATE: 1 OF 2

FUGRO GEOSCIENCES,INC

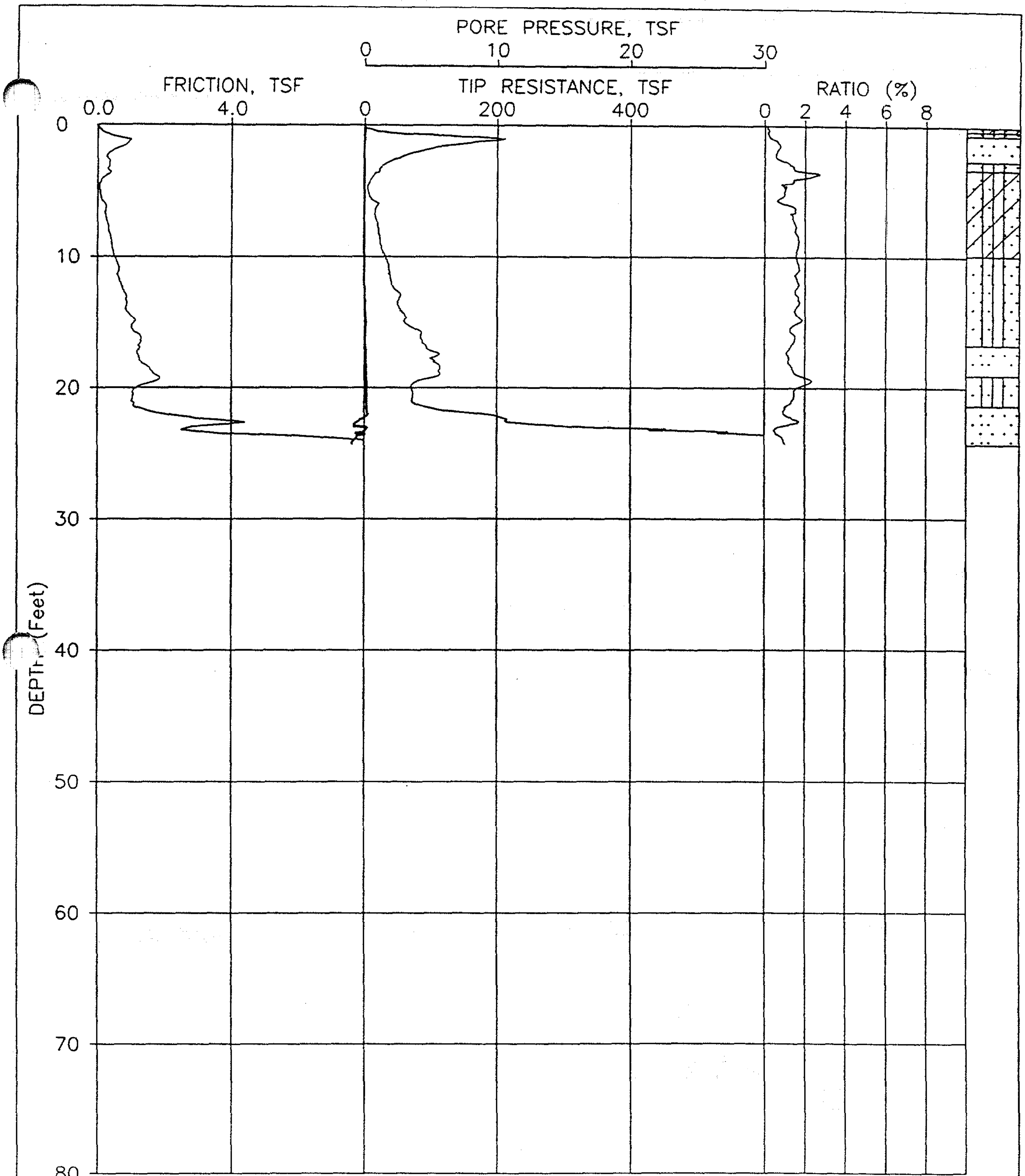


JOB NUMBER: 97-7050 CPT NUMBER: 07 DATE: 04-05-1997

ELEVATION: 0.00 CONE NUMBER: F7.5CKEW949 PLATE: 2 OF 2

FUGRO GEOSCIENCES,INC

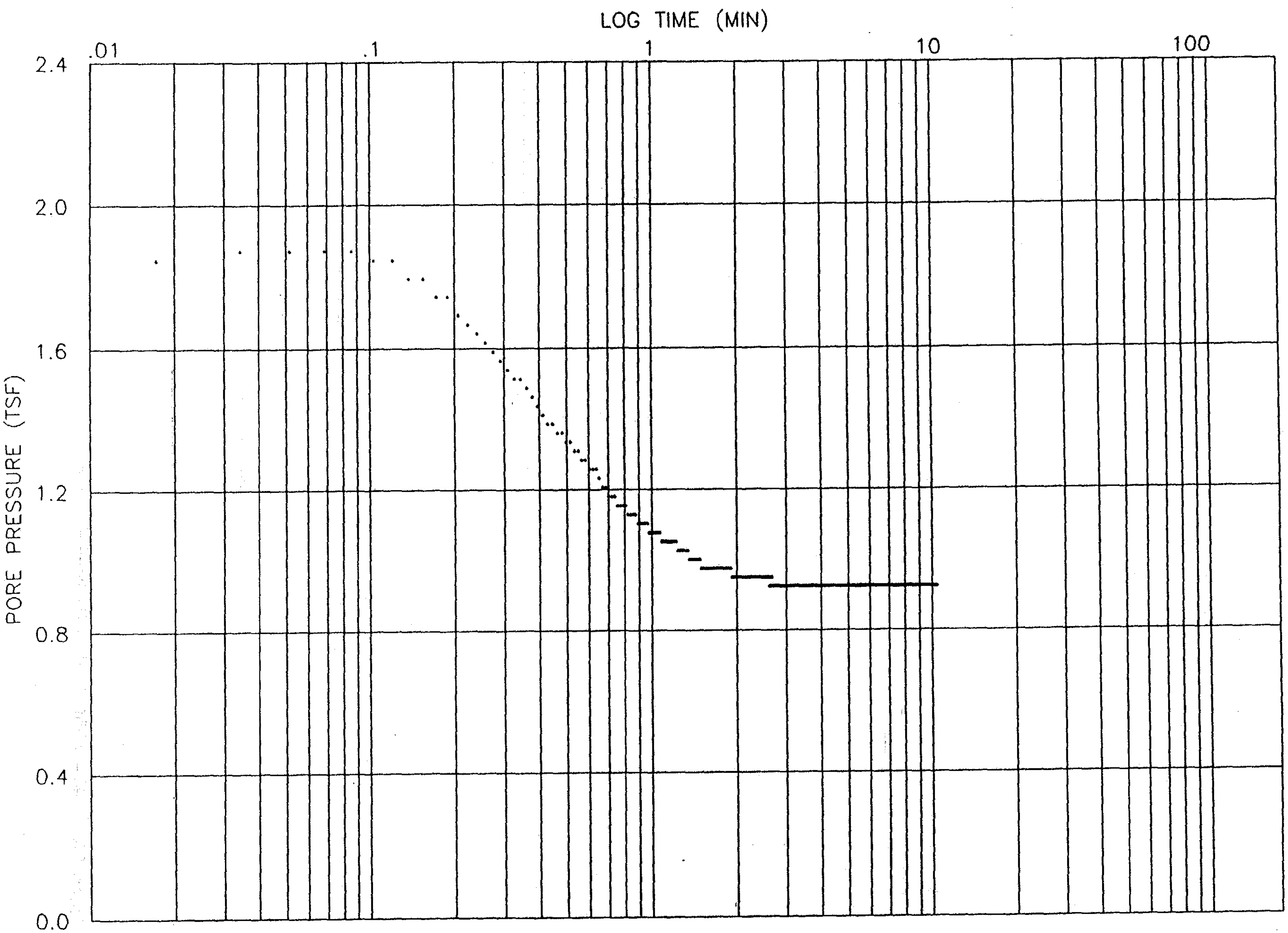
DRAFT



JOB NUMBER: 97-7050 CPT NUMBER: 08 DATE: 04-05-1997

ELEVATION: 0.00 CONE NUMBER: F7.5CKEW949 PLATE: 1 OF 1

FUGRO GEOSCIENCES,INC



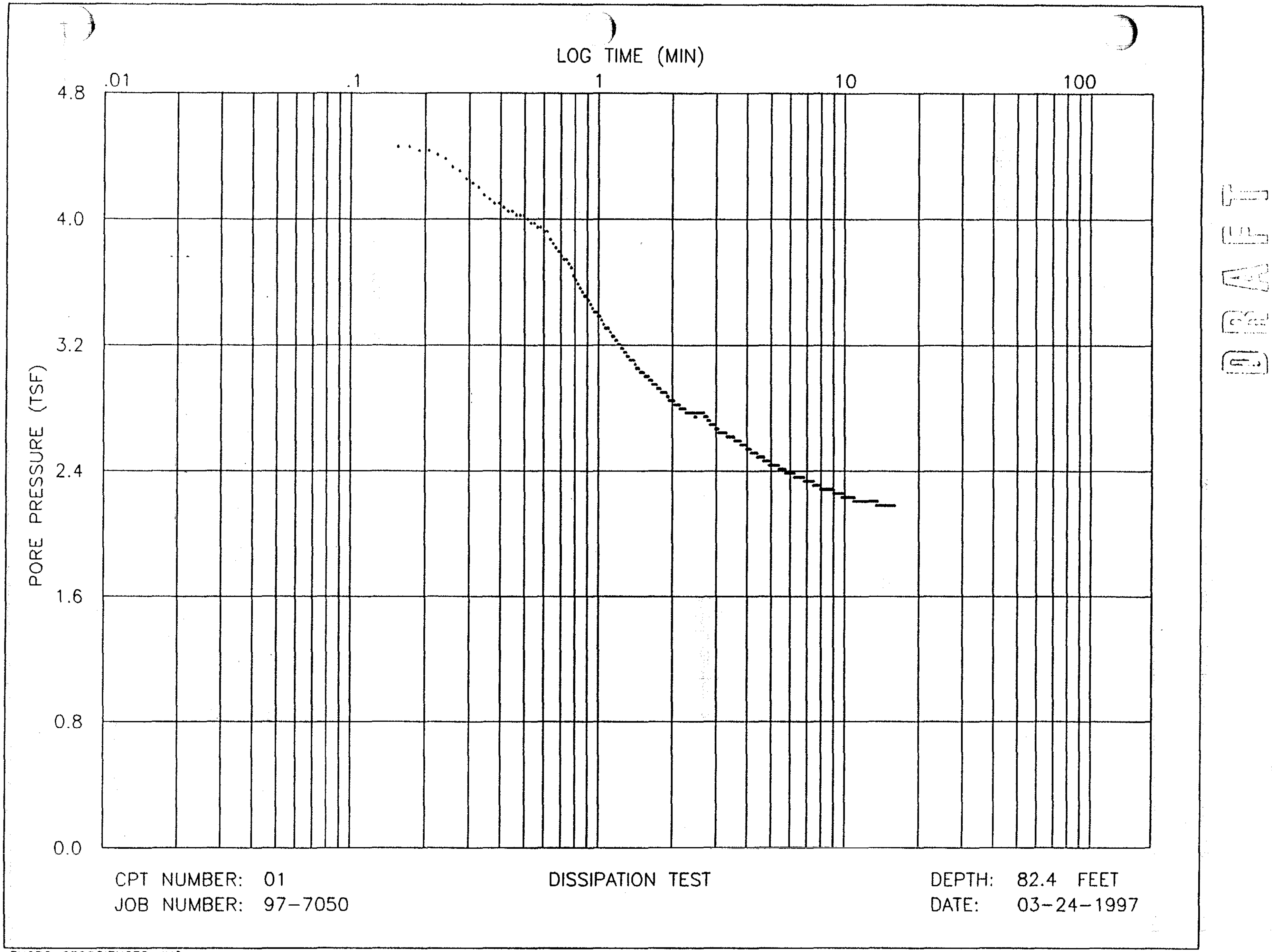
CPT NUMBER: 01
JOB NUMBER: 97-7050

DISSIPATION TEST

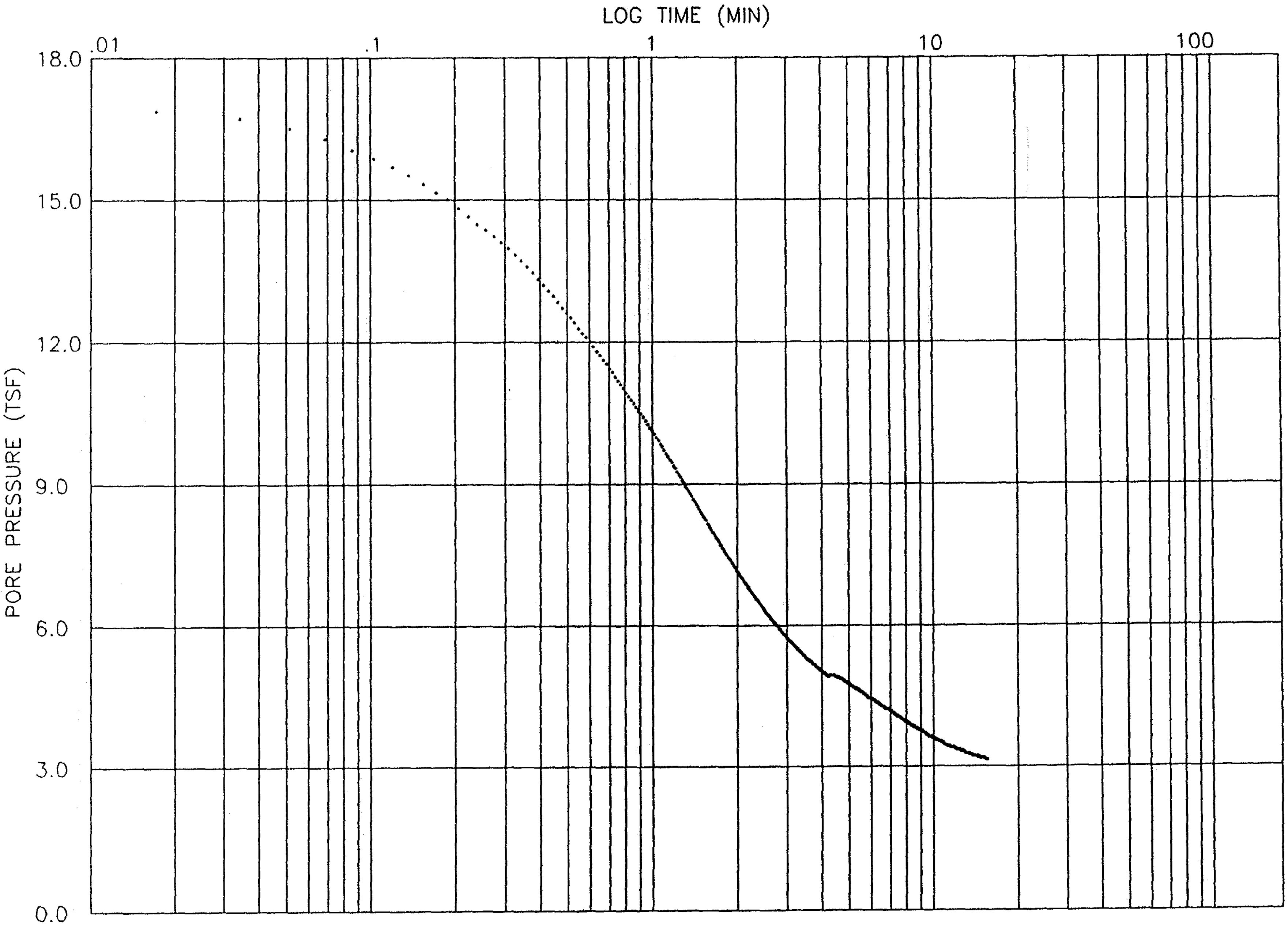
DEPTH: 49.2 FEET
DATE: 03-24-1997

DRAFT

FUGRO GEOSCIENCES, INC.



FUGRO GEOSCIENCES, INC.



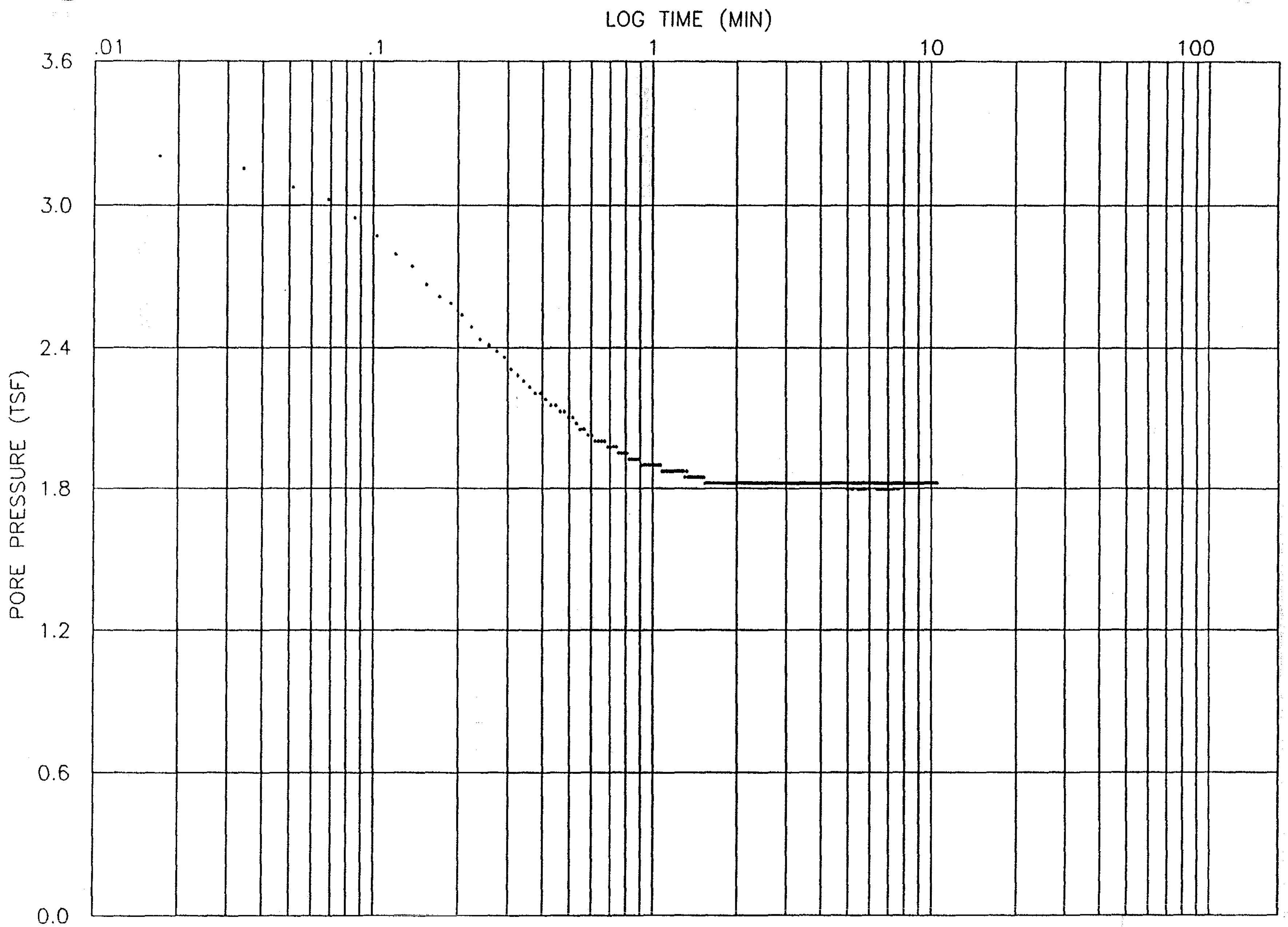
CPT NUMBER: 01
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 109.2 FEET
DATE: 03-24-1997

DRAFT

FUGRO SCIENCES, INC.



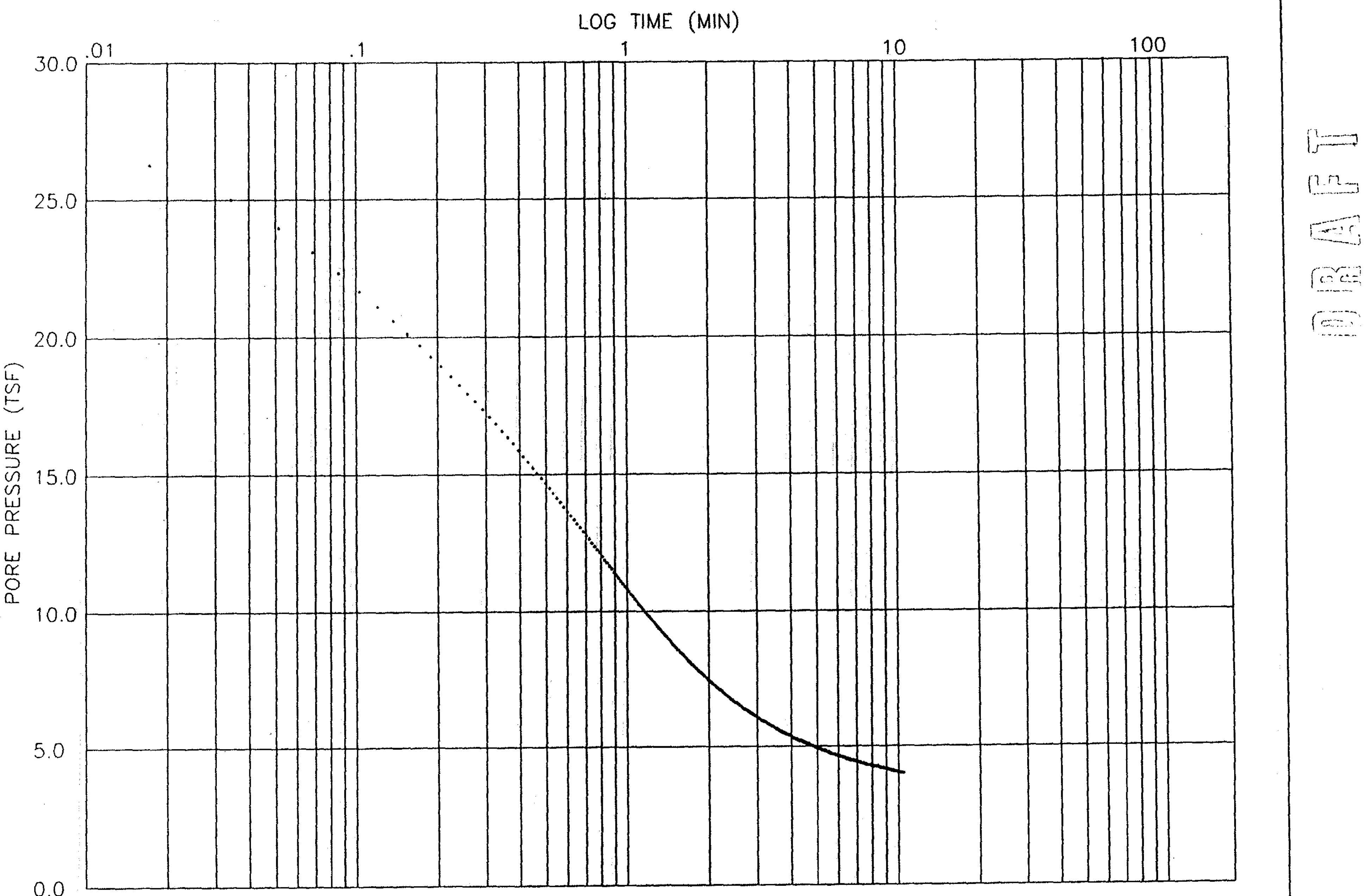
CPT NUMBER: 02
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 80.8 FEET
DATE: 03-24-1997

FUGRO GEOSCIENCES, INC.

DRAFT

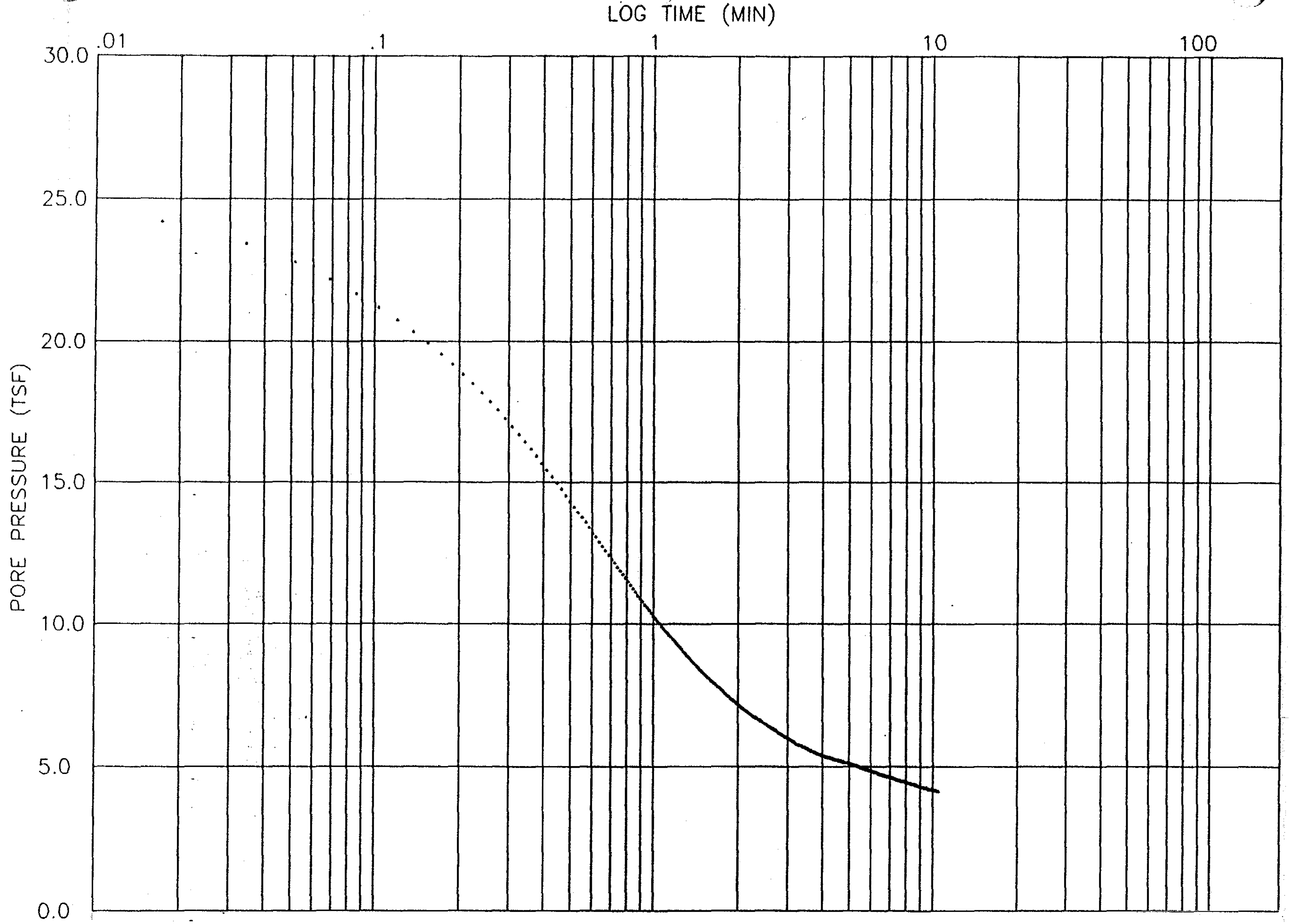


CPT NUMBER: 02
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 116.6 FEET
DATE: 03-24-1997

FUGRO GEOSCIENCES, INC.

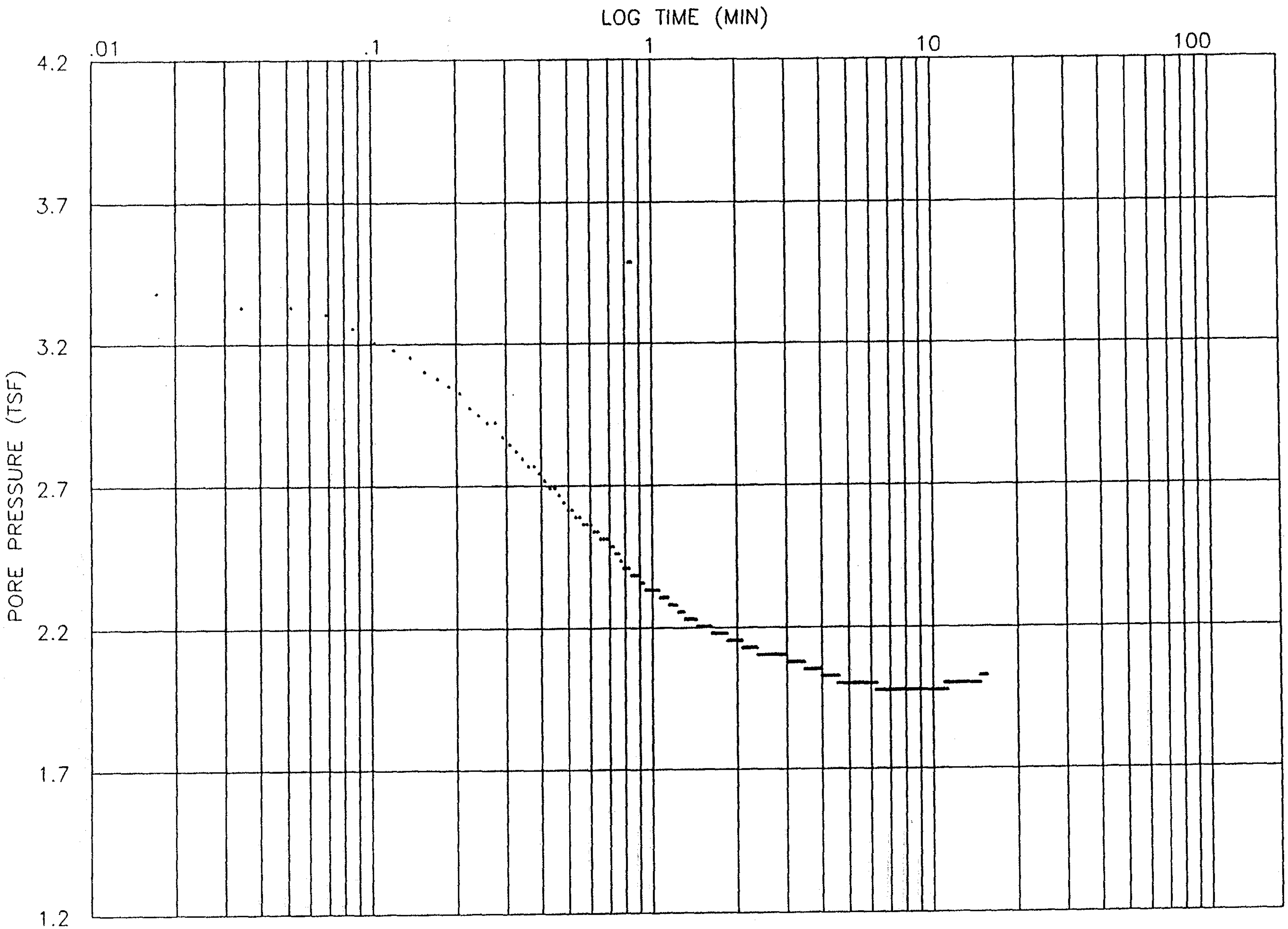


CPT NUMBER: 02
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 125.4 FEET
DATE: 03-24-1997

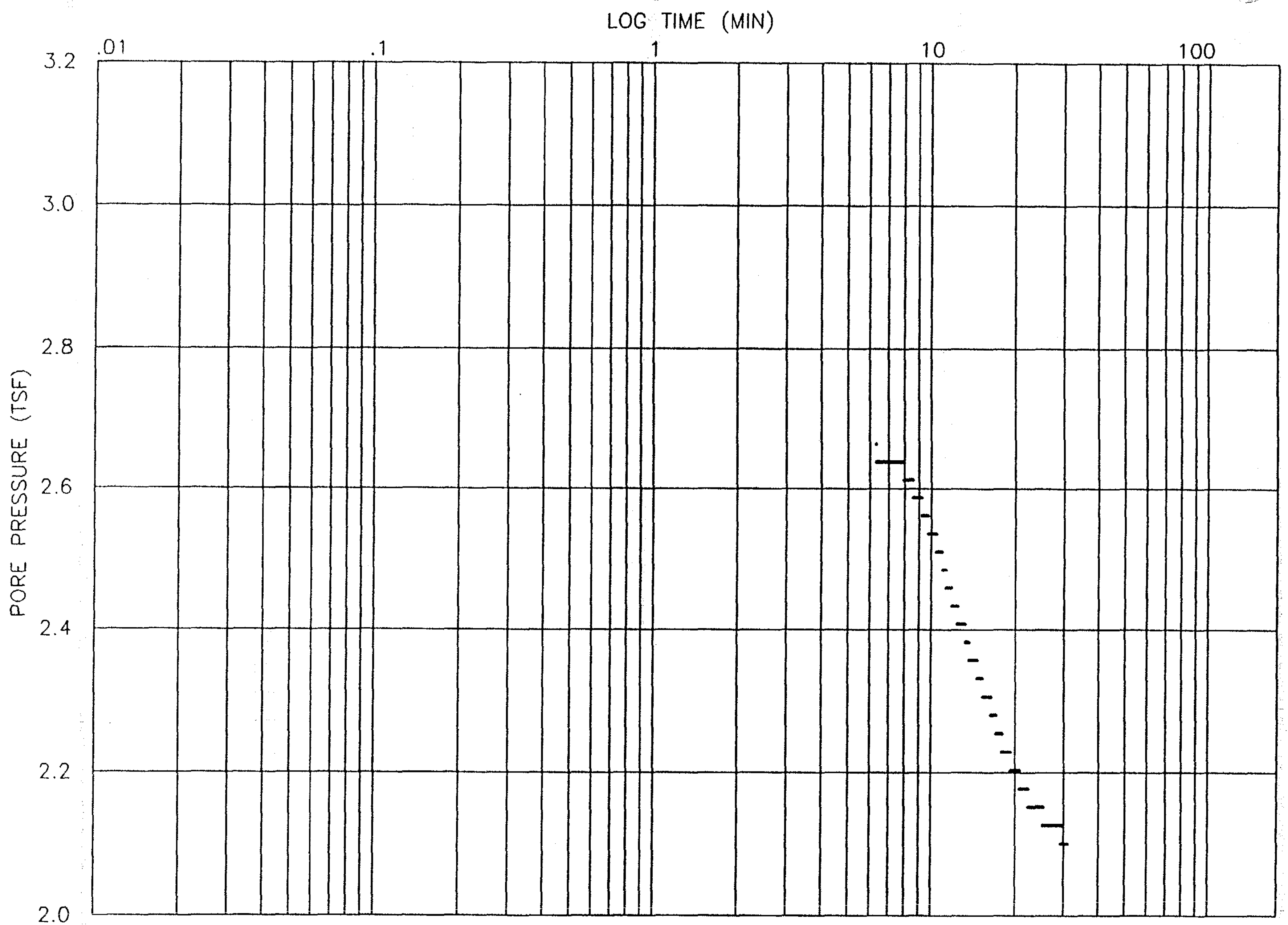
FUGRO GEOSCIENCES, INC.



CPT NUMBER: 03
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 82.5 FEET
DATE: 03-25-1997

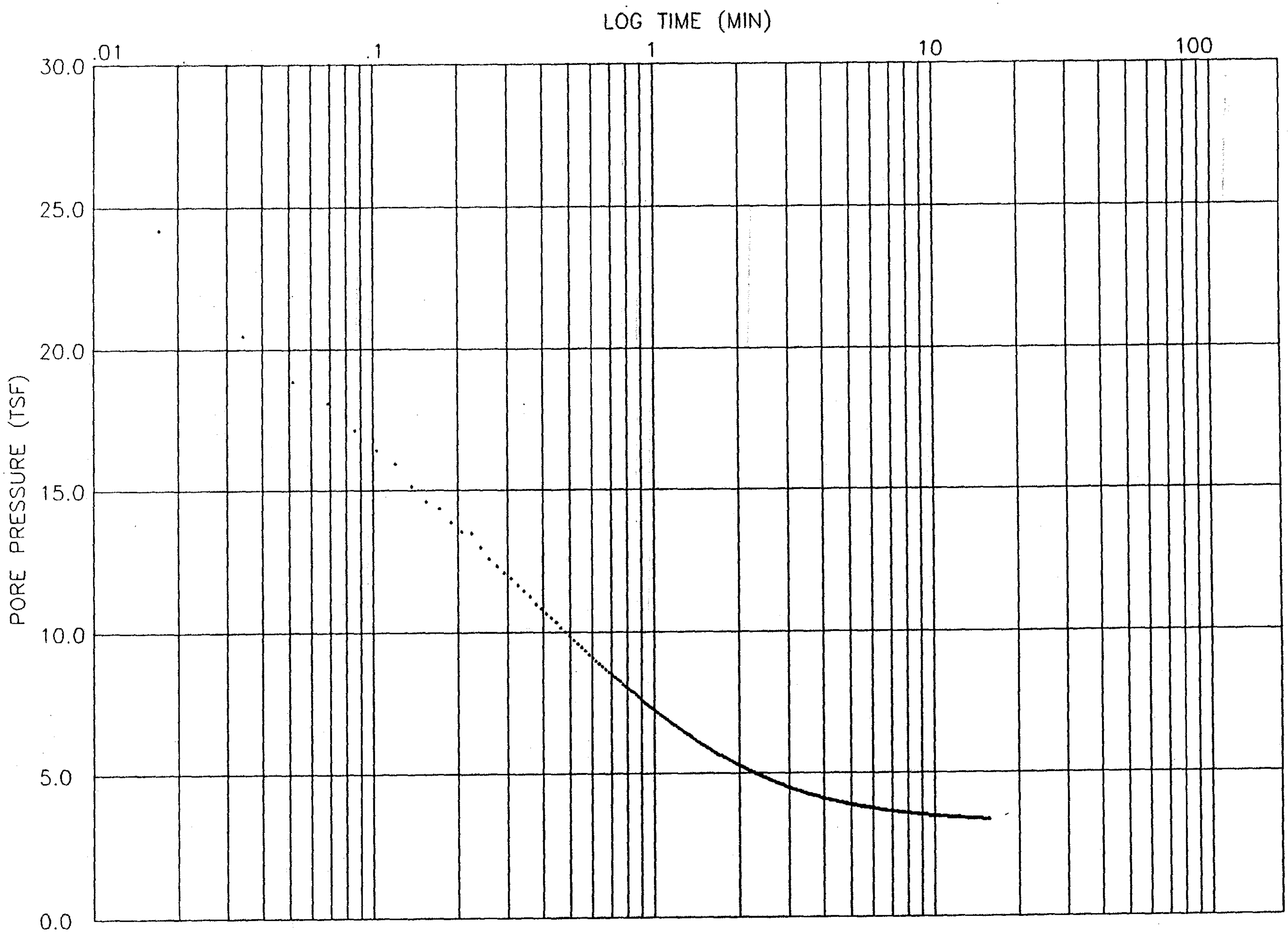


CPT NUMBER: 04
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 80.6 FEET
DATE: 03-25-1997

FUGRO GEOSCIENCES, INC.

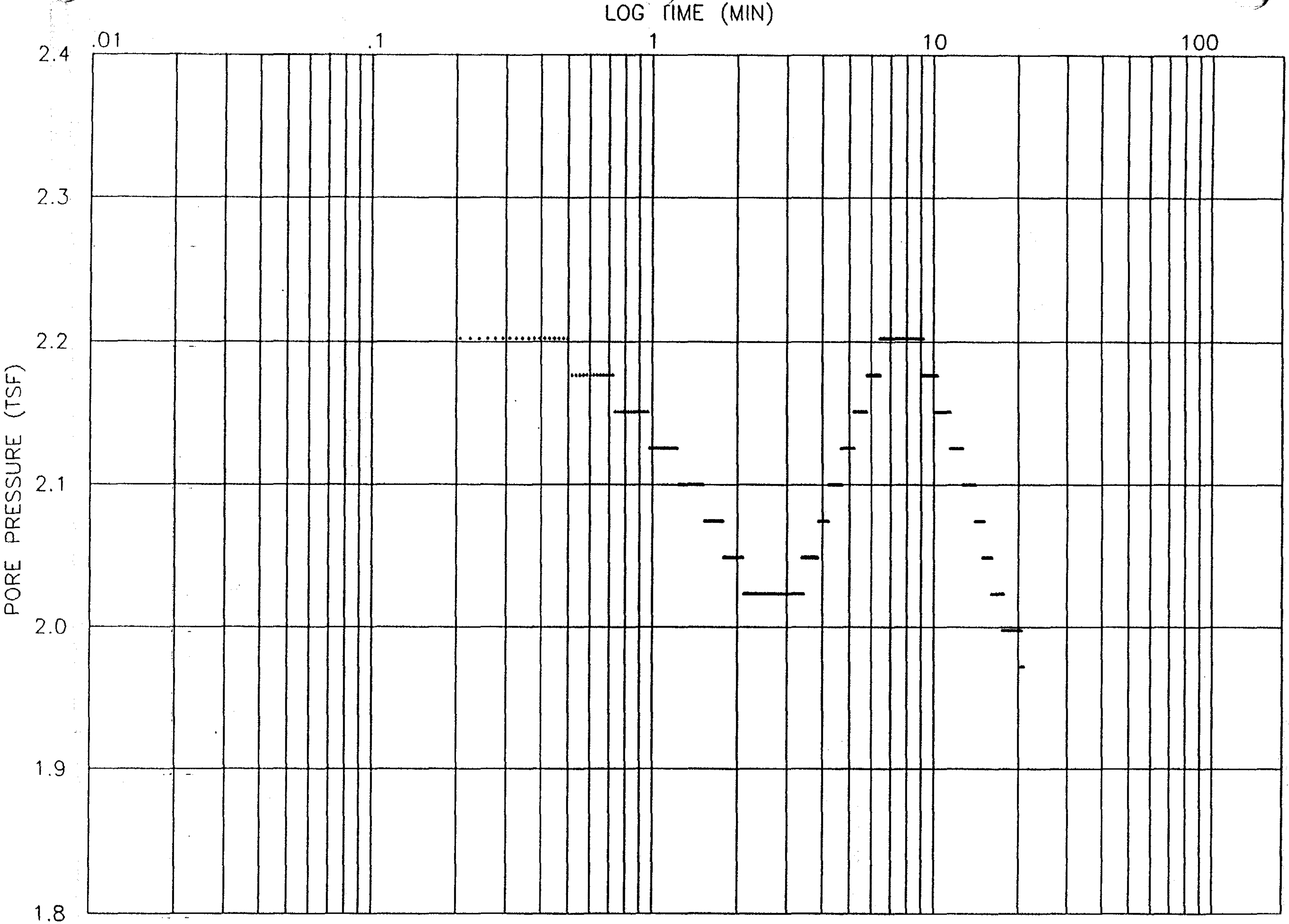


CPT NUMBER: 04
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 127.1 FEET
DATE: 03-25-1997

FUGRO GEOSCIENCES, INC.

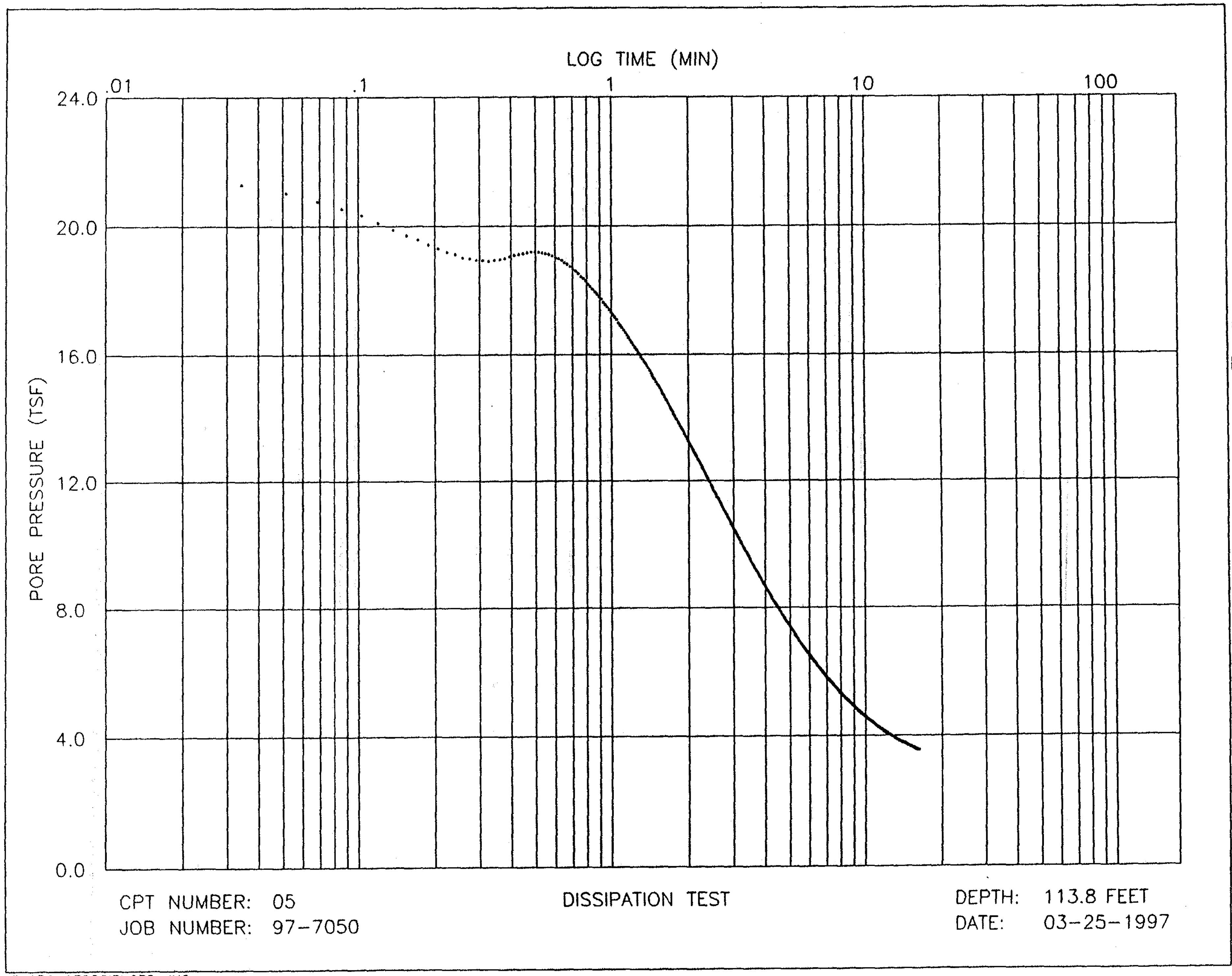


CPT NUMBER: 05
JOB NUMBER: 97-7050

DISSIPATION TEST

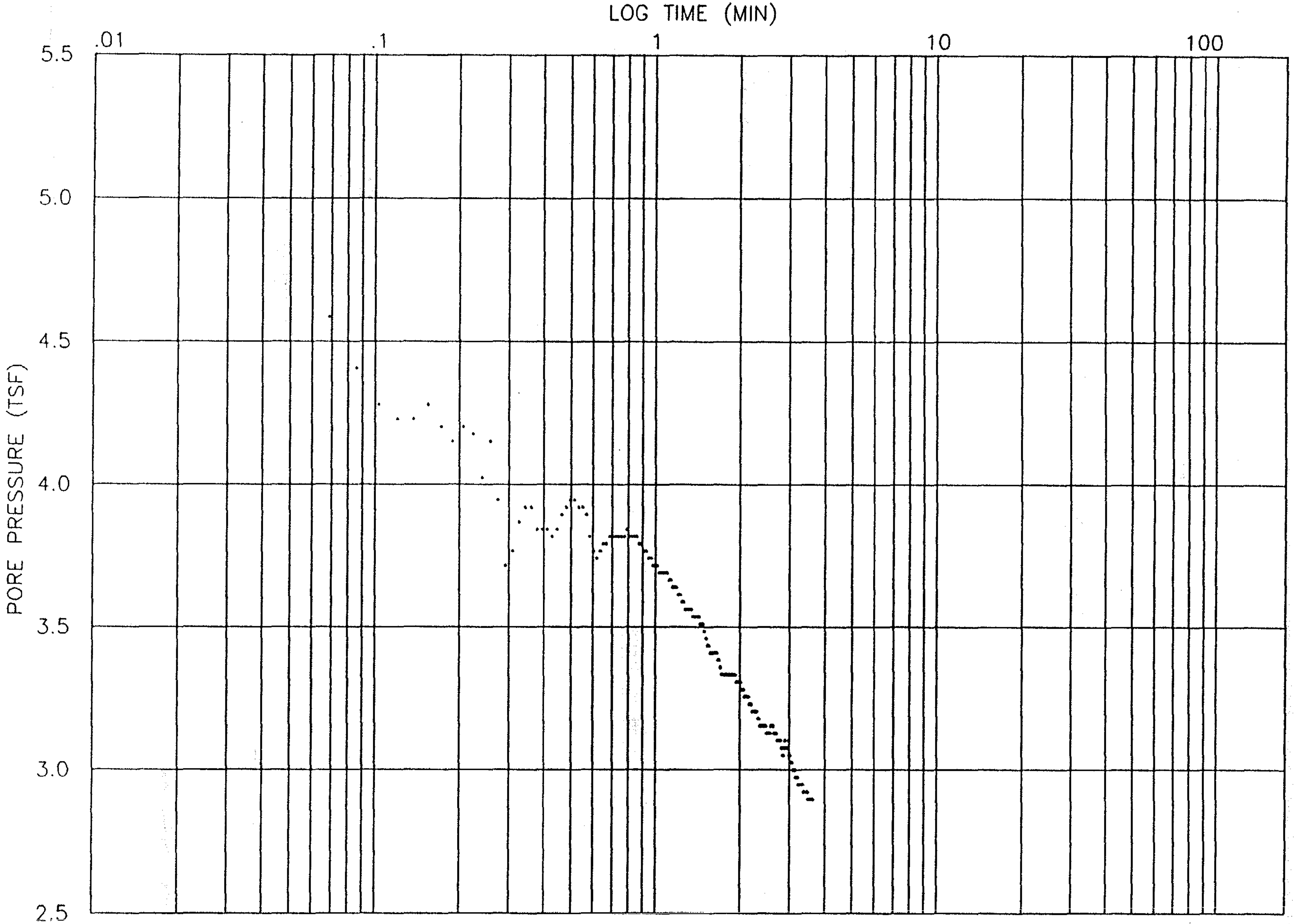
DEPTH: 83.2 FEET
DATE: 03-25-1997

FUGRO GEOSCIENCES, INC.



DRAFT

FUGRO GEOSCIENCES, INC.

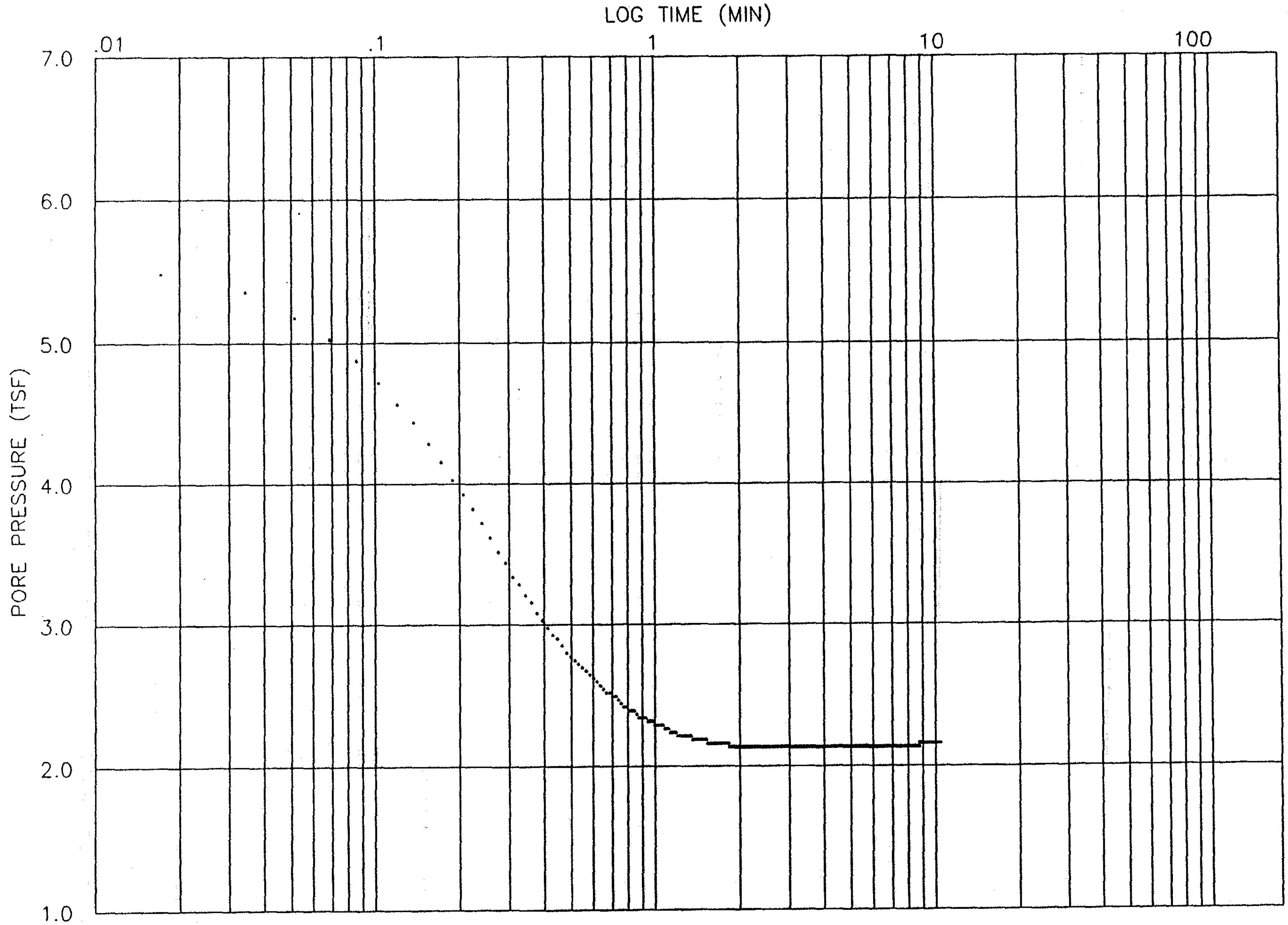


CPT NUMBER: 06
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 83.9 FEET
DATE: 03-25-1997

FUGRO GEOSCIENCES, INC.



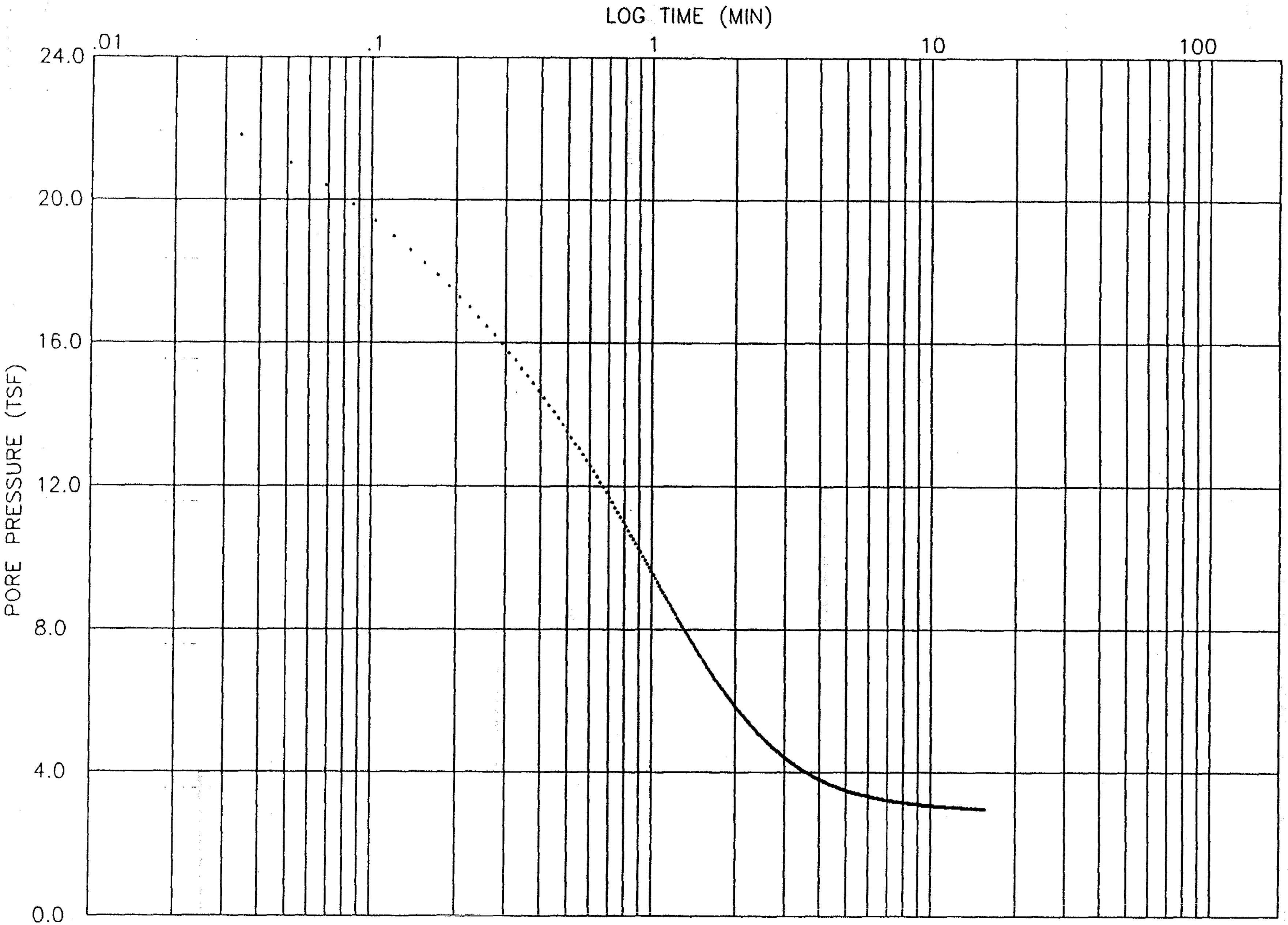
CPT NUMBER: 06
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 95.1 FEET
DATE: 03-25-1997

FUGRO G[illegible]SCIENCES, INC.

DRAFT

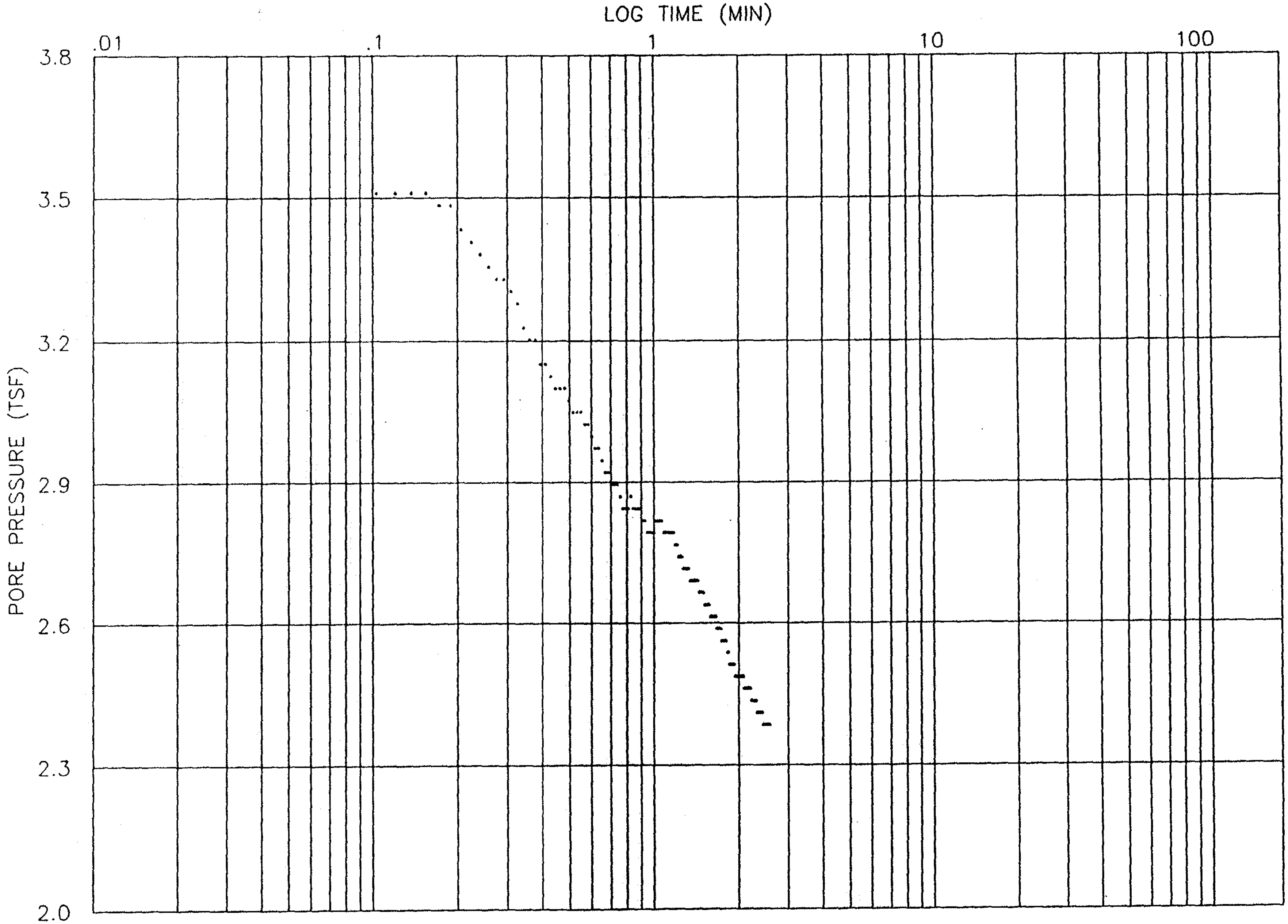


CPT NUMBER: 06
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 113.9 FEET
DATE: 03-25-1997

FUGRO GEOSCIENCES, INC.



CPT NUMBER: 07
JOB NUMBER: 97-7050

DISSIPATION TEST

DEPTH: 81.3 FEET
DATE: 04-05-1997

FUGRO GEOSCIENCES, INC.

APPENDIX I

FIELD SCREENING GROUNDWATER ANALYTICAL RESULTS
ONSITE MOBILE LABORATORY
SUPPLEMENTAL SCREENING (PHASE II)

Table I-1
Groundwater Screening Results
(Onsite Field Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample ID	Depth Interval (feet bls)	Analyte Concentration ($\mu g/\ell$)				
		1,1-DCE	Trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
39Q00101F	15 to 17	<2	<2	<2	<2	**38**
39Q00102F	20 to 22	<2	<2	<2	<2	**99**
39Q00103F	25 to 27	<2	<2	<2	<2	**10**
39Q00104F	30 to 32	<2	<2	<2	<2	<2
39Q00105F	36 to 37	<2	<2	<2	<2	<2
39Q00106F	40 to 41	<2	<2	<2	<2	<2
39Q00107F	45 to 46	<2	<2	<2	<2	<2
39Q00108F	50 to 51	<2	<2	<2	<2	<2
39Q00109F	60 to 61	<2	<2	<2	<2	<2
39Q00110F	70 to 71	<2	<2	<2	<2	<2
39Q00111F	80 to 81	<2	<2	<2	<2	<2
39Q00201F	15 to 17	<2	<2	<2	<2	**44**
39Q00202F	20 to 22	<2	<2	<2	<2	**26**
39Q00203F	25 to 27	<2	<2	<2	<2	**90**
39Q00204F	28 to 30	<2	<2	<2	<2	**12**
39Q00204FD	–	<2	<2	<2	<2	**6.0**
39Q00301F	20 to 22	<2	<2	<2	<2	2.0
39Q00302F	25 to 27	<2	<2	<2	<2	<2
39Q00303F	30 to 32	<2	<2	<2	<2	<2
39Q00401F	20 to 22	<2	<2	<2	<2	**23**
39Q00402F	25 to 27	<2	<2	<2	<2	**119**
39Q00403F	30 to 32	<2	<2	<2	2.0	**62**
39Q00404F	35 to 36	<2	<2	<2	<2	<2
39Q00405F	40 to 41	<2	<2	<2	<2	<2
39Q00406F	45 to 46	<2	<2	<2	<2	<2
39Q00407F	50 to 51	<2	<2	<2	<2	<2
39Q00408F	60 to 61	<2	<2	<2	<2	<2
39Q00409F	70 to 71	<2	<2	<2	<2	<2
39Q00410F	80 to 81	<2	<2	<2	<2	<2
39Q00410FD	–	<2	<2	<2	<2	<2
39Q00501F	15 to 17	<2	<2	<2	<2	**11**
39Q00502F	20 to 22	<2	<2	<2	<2	**4.5**
39Q00503F	25 to 27	<2	<2	<2	<2	2.0
39Q00504F	30 to 32	<2	<2	<2	<2	7.0

See notes at end of table.

Table I-1 (Continued)
Groundwater Screening Results
(Onsite Field Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample ID	Depth Interval (feet bls)	Analyte Concentration (μg/ℓ)				
		1,1-DCE	Trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
39Q00601F	16 to 18	<2	<2	<2	<2	2.0
39Q00602F	20 to 22	<2	<2	<2	<2	**5.0**
39Q00602FD	--	<2	<2	<2	<2	**5.0**
39Q00701F	15 to 16	<2	<2	<2	<2	<2
39Q00702F	20 to 21	<2	<2	<2	<2	<2
39Q00703F	25 to 26	<2	<2	<2	<2	<2
39Q00704F	29 to 30	<2	<2	<2	<2	<2
39Q00705F	35 to 36	<2	<2	<2	<2	<2
39Q00706F	40 to 41	<2	<2	<2	<2	<2
39Q00801F	15 to 16	<2	<2	<2	<2	<2
39Q00802F	20 to 21	<2	<2	<2	<2	<2
39Q00803F	25 to 26	<2	<2	<2	<2	<2
39Q00804F	29 to 30	<2	<2	<2	<2	<2
39Q00805F	35 to 36	<2	<2	<2	<2	<2
39Q00901F	15 to 16	<2	<2	<2	<2	<2
39Q00902F	20 to 21	<2	<2	<2	<2	<2
39Q00903F	25 to 26	<2	<2	<2	<2	**5.2**
39Q00904F	29 to 30	<2	<2	<2	<2	<2
39Q00905F	35 to 36	<2	<2	<2	<2	<2
39Q01001F	15 to 16	<2	<2	<2	<2	<2
39Q01002F	20 to 21	<2	<2	<2	<2	<2
39Q01003F	25 to 27	<2	<2	<2	<2	**3.3**
39Q01004F	29 to 30	<2	<2	<2	<2	**3.5**
39Q01005F	35 to 36	<2	<2	<2	<2	<2
39Q01101F	15 to 16	<2	<2	<2	<2	<2
39Q01102F	20 to 22	<2	<2	<2	<2	<2
39Q01103F	25 to 27	<2	<2	<2	<2	<2
39Q01104F	30 to 32	<2	<2	<2	<2	<2
39Q01105F	35 to 37	<2	<2	<2	<2	<2
39Q01201F	15 to 16	<2	<2	<2	<2	<2
39Q01202F	20 to 21	<2	<2	<2	<2	**25**
39Q01203F	25 to 26	<2	<2	<2	<2	**66**
39Q01204F	29 to 30	<2	<2	<2	<2	**116**
39Q01205F	35 to 36	<2	<2	<2	<2	<2

See notes at end of table.

Table I-1 (Continued)
Groundwater Screening Results
(Onsite Field Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample ID	Depth Interval (feet bls)	Analyte Concentration (μg/ℓ)				
		1,1-DCE	Trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
39Q01301F	15 to 16	<2	<2	<2	<2	**5.1**
39Q01302F	20 to 21	<2	<2	<2	<2	**21**
39Q01303F	25 to 26	<2	<2	<2	**2.2**	**107**
39Q01304F	28 to 29	<2	<2	<2	<2	**57**
39Q01305F	35 to 36	<2	<2	<2	<2	<2
39Q01401F	15 to 16	<2	<2	<2	<2	**25**
39Q01402F	20 to 21	<2	<2	<2	<2	**12**
39Q01403F	25 to 26	<2	<2	<2	<2	**57**
39Q01404F	28 to 29	<2	<2	<2	<2	**234**
39Q01405F	35 to 36	<2	<2	<2	<2	**7.8**
39Q01405FD	--	<2	<2	<2	<2	**7.1**
39Q01501F	15 to 16	<2	<2	<2	<2	**16**
39Q01502F	20 to 21	<2	<2	<2	<2	**62**
39Q01503F	25 to 26	<2	<2	<2	<2	**78**
39Q01504F	29 to 30	<2	<2	<2	<2	**16**
39Q01505F	35 to 36	<2	<2	<2	<2	<2
39Q01601F	15 to 16	<2	<2	<2	<2	<2
39Q01602F	20 to 21	<2	<2	<2	<2	**4.0**
39Q01603F	25 to 26	<2	<2	<2	<2	**76**
39Q01604F	29 to 30	<2	<2	<2	**2.2**	**146**
39Q01605F	35 to 36	<2	<2	<2	<2	**18**
39Q01701F	15 to 16	<2	<2	<2	<2	<2
39Q01702F	20 to 21	<2	<2	<2	<2	**2.1**
39Q01703F	25 to 26	<2	<2	<2	<2	**2.8**
39Q01704F	28 to 29	<2	<2	<2	<2	**2.1**
39Q01705F	35 to 36	<2	<2	<2	<2	<2
39Q01801	15 to 16	<2	<2	<2	<2	<2
39Q01802F	20 to 21	<2	<2	<2	<2	<2
39Q01803F	25 to 26	<2	<2	<2	<2	**40**
39Q01901F	15 to 16	<2	<2	<2	<2	**8.8**
39Q01902F	20 to 21	<2	<2	<2	<2	<2
39Q01903F	25 to 26	<2	<2	<2	<2	**37**
39Q01903FD	25 to 26	<2	<2	<2	<2	**31**
39Q01904F	28 to 29	<2	<2	<2	<2	**183**

See notes at end of table.

Table I-1 (Continued)
Groundwater Screening Results
(Onsite Field Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample ID	Depth Interval (feet bls)	Analyte Concentration (μg/ℓ)				
		1,1-DCE	Trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
39Q01905F	35 to 36	<2	<2	<2	<2	**6.2**
39Q01906F	40 to 41	<2	<2	<2	<2	<2
39Q02001F	15 to 16	<2	<2	<2	<2	<2
39Q02002F	20 to 21	<2	<2	<2	<2	<2
39Q02002FD	--	<2	<2	<2	<2	<2
39Q02003F	25 to 26	<2	<2	<2	<2	**71**
39Q02003FD	--	<2	<2	<2	<2	**68**
39Q02004F	28 to 29	<2	<2	<2	<2	**114**
39Q02005F	35 to 36	<2	<2	<2	<2	**22**
39Q02006F	40 to 41	<2	<2	<2	<2	**228**
39Q02006FD	--	<2	<2	<2	**2.2**	**243**
39Q02101F	15 to 16	<2	<2	<2	<2	<2
39Q02102F	20 to 21	<2	<2	<2	<2	<2
39Q02201F	15 to 16	<2	<2	<2	<2	<2
39Q02202F	20 to 21	<2	<2	<2	<2	<2
39Q02203F	25 to 26	<2	<2	<2	<2	**11**
39Q02204F	28 to 29	<2	<2	<2	<2	**183**
39Q02205F	35 to 36	<2	<2	<2	<2	**22**
39Q02206F	40 to 41	<2	<2	<2	<2	**26**
39Q02207F	45 to 46	<2	<2	<2	<2	**26**
39Q02208F	50 to 51	<2	<2	<2	<2	**46**
39Q02209F	60 to 61	<2	<2	<2	<2	**8.9**
39Q02210F	70 to 71	<2	<2	<2	<2	<2
39Q02210FD	--	<2	<2	<2	<2	<2
39Q02211F	80 to 81	<2	<2	<2	<2	<2
39Q02211FD	--	<2	<2	<2	<2	<2
39Q02301F	15 to 16	<2	<2	<2	<2	<2
39Q02302F	20 to 21	<2	<2	<2	<2	<2
39Q02303f	25 to 26	<2	<2	<2	<2	<2
39Q02401F	15 to 16	<2	<2	<2	<2	<2
39Q02402F	20 to 21	<2	<2	<2	<2	<2
39Q02403F	24 to 25	<2	<2	<2	<2	<2
39Q02501F	15 to 16	<2	<2	<2	<2	<2
39Q02502F	20 to 21	<2	<2	<2	<2	<2

See notes at end of table.

Table I-1 (Continued)
Groundwater Screening Results
(Onsite Field Laboratory)

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

Sample ID	Depth Interval (feet bls)	Analyte Concentration (μg/ℓ)				
		1,1-DCE	Trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
39Q02503F	25 to 26	<2	<2	<2	<2	<2
39Q02504F	28 to 29	<2	<2	<2	<2	<2
39Q02505F	35 to 36	<2	<2	<2	<2	<2
39Q02506F	40 to 41	<2	<2	<2	<2	<2
39Q02601F	15 to 16	<2	<2	<2	<2	<2
39Q02602F	20 to 21	<2	<2	<2	<2	<2
39Q02701F	15 to 16	<2	<2	<2	<2	<2
39Q02702F	20 to 21	<2	<2	<2	<2	**4.2**
39Q02801F	15 to 16	<2	<2	<2	<2	<2
39Q02802F	20 to 21	<2	<2	<2	<2	<2
39Q02803F	25 to 26	<2	<2	<2	<2	<2
39Q02803FD	--	<2	<2	<2	<2	<2
39Q02901F	15 to 16	<2	<2	<2	<2	<2
39Q02902F	20 to 21	<2	<2	<2	<2	<2
39Q02903F	25 to 26	<2	<2	<2	<2	<2
39Q02904F	28 to 29	<2	<2	<2	<2	<2
39Q02905F	35 to 36	<2	<2	<2	<2	<2
39Q02906F	40 to 41	<2	<2	<2	<2	<2
39Q03001F	15 to 16	<2	<2	<2	2.2	<2
39Q03002F	20 to 21	<2	<2	<2	<2	<2
39Q03003F	25 to 26	<2	<2	<2	<2	<2
39Q03004F	30 to 31	<2	<2	<2	<2	<2
39Q03005F	35 to 36	<2	<2	<2	<2	<2
39Q03005FD	--	<2	<2	<2	<2	<2

Notes: ID = identifier.
bls = below land surface.
μg/ℓ = micrograms per liter.
DCE = dichloroethene.
TCE = trichloroethene.
PCE = perchloroethylene.
< = less than.
-- = not detected.

APPENDIX J

NATURAL ATTENUATION ASSESSMENT RESULTS

TABLE J-1

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
NATURAL ATTENUATION PARAMETERS

Appendix J

Table J-1. Summary of Groundwater Analytical Results
Natural Attenuation Parameters
Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID		39G00303	39G00402	39G00702	39G01201	39G01301	39G01401	39G01501	39G01601
Screened Interval (ft bls)		6-16	5-15	27-32	6-16	23-28	35-40	19-24	35-40
Sampling Date		16-May-97	22-May-97	15-May-97	13-May-97	13-May-97	14-May-97	22-May-97	22-May-97
General Chemistry	**Units**								
Alkalinity (total)	MG/L	71	34	17	119	34	34	34	34
Carbon dioxide	MG/L	40	45	50	1.2	NA	50	100	65
Chloride	MG/L	10	15	0.1	5	NA	15	20	15
Dissolved Iron	MG/L	0.1	0.5	0.6	0.1	0.3	1	1	0.9
Dissolved Iron (II)	MG/L	0.1	0	0.5		0.1	0.8	0.9	0.8
Dissolved Oxygen	MG/L	3	0.8	0.7	7	NA	0.8	0.8	1
Ethane	UG/L	0	0	NA	0	0	0	0	0
Ethene	UG/L	0	0	NA	0	0	0	0	0
Hydrogen Sulfide	MG/L	0.1	0	2	0.1	5	0.5	0.7	5
Methane	UG/L	0	0	NA	16	0	3	3	3
Nitrate	MG/L	1.4	0.3	0.02 U	0.6	0.2 U	0.2 U	0.02 U	0.07
Nitrite	MG/L	0.02 U	0.02 U	0.02 U	0.2 U	0.2 U	0.2 U	0.02 U	0.02 U
Oxidation-reduction Potential	mV	213	250	32	163	176	73	138	40
Sulfate	MG/L	15	14	9	5 U	25 U	8	45	14
Sulfide	MG/L	1.8	1.4	1 U	1 U	4	1 U	1 U	1.2
Total Organic Carbon	MG/L	8	18	17	1	11	5	15	2

Appendix J
Table J-1. Summary of Groundwater Analytical Results
Natural Attenuation Parameters
Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID		39G01701		39G01701D		39G01801		39G01901		39G02001		39G02101		39G02201		39G02301	
Screened Interval (ft bls)		6-16		6-16		23-28		45-50		6-16		23-28		35-40		6-16	
Sampling Date		21-May-97		21-May-97		21-May-97		22-May-97		14-May-97		19-May-97		19-May-97		14-May-97	
General Chemistry	**Units**																
Alkalinity (total)	MG/L	93		NA		34		35		71		50		51		170	
Carbon dioxide	MG/L	50		NA		100		50		60		80		40		125	
Chloride	MG/L	15		NA		35		20		10		15		15		20	
Dissolved Iron	MG/L	0.2		NA		0.5		1.1		0.4		0.7		0.8		0.1	
Dissolved Iron (II)	MG/L	0.2		NA		0.4		0.9		0.2		0.6		0.7		0.1	
Dissolved Oxygen	MG/L	1.2		NA		1		0.8		2.4		0.8		0.3		3.7	
Ethane	UG/L	0		0		0		0		0		0		0		0	
Ethene	UG/L	0		0		0		0		0		0		0		0	
Hydrogen Sulfide	MG/L	0		NA		0.5		5		0		0.7		2		0.3	
Methane	UG/L	13		4		0		8		0		2	J	12		2	J
Nitrate	MG/L	9.1		NA		0.07		0.02		NA		0.02	U	0.02	U	3.6	
Nitrite	MG/L	0.08		NA		0.02	U	0.02	U	NA		0.02		0.02	U	0.2	U
Oxidation-reduction Potential	mV	177		NA		107		61		255		70		58		138	
Sulfate	MG/L	41		NA		64		16		NA		17		14		34	
Sulfide	MG/L	1	U	NA		1.2		1	U	NA		1.8		1		1	
Total Organic Carbon	MG/L	11		NA		8		15		NA		20		4		13	

Appendix J
Table J-1. Summary of Groundwater Analytical Results
Natural Attenuation Parameters
Study Area 39

Naval Training Center, Orlando
Orlando, FL

Sample ID		39G02401		39G02501		39G02601	
Screened Interval (ft bls)		23-28		35-40		35-40	
Sampling Date		14-May-97		15-May-97		15-May-97	
General Chemistry	**Units**						
Alkalinity (total)	MG/L	34		50		34	
Carbon dioxide	MG/L	NA		80		50	
Chloride	MG/L	30		45		15	
Dissolved Iron	MG/L	0.6		1		0.8	
Dissolved Iron (II)	MG/L	0.8		1		0.6	
Dissolved Oxygen	MG/L	1.5		0.7		0.6	
Ethane	UG/L	0		0		0	
Ethene	UG/L	0		0		0	
Hydrogen Sulfide	MG/L	5		2		20	
Methane	UG/L	4		2	J	5	
Nitrate	MG/L	0.02	U	0.02	U	0.02	U
Nitrite	MG/L	0.04		0.02	U	0.02	U
Oxidation-reduction Potential	mV	10		17		22	
Sulfate	MG/L	43		10		13	
Sulfide	MG/L	2		1	U	1	U
Total Organic Carbon	MG/L	11		3		14	

TABLE J-2

STATISTICAL ANALYSIS OF NATURAL ATTENUATION PARAMETERS

Appendix J

Table J-2. Statistical Analysis of Natural Attenuation Parameters

Study Area 39

Naval Training Center, Orlando

Orlando, FL

SUMMARY STATISTICS					
Parameter	Units	Minimum	Maximum	Mean*	Criteria
Alkalinity (total)	MG/L	17	170	55.5	>2*BK (>238 surficial, >68 deep)
Carbon dioxide	MG/L	1.2	125	61.6	>2*BK (>2.4 surficial, >100 deep)
Chloride	MG/L	0.1	45	17.7	>2*BK (>10 surficial, >30 deep)
Dissolved Iron	MG/L	0.1	1.1	0.6	
Dissolved Iron (II)	MG/L	0	1	0.5	>1
Dissolved Oxygen	MG/L	0.3	7	1.6	<0.5
Ethane	UG/L	0	0	0.0	<0.1
Ethene	UG/L	0	0	0.0	<0.1
Hydrogen Sulfide	MG/L	0	20	2.7	
Methane	UG/L	0	16	4.1	>0.1
Nitrate	MG/L	<0.02	9.1	0.9	<1
Nitrite	MG/L	<0.02	0.2	0.1	
Oxidation-Reduction Potential	mV	10	255	111.1	<50mV
Sulfate	MG/L	<5	64	22.8	<20
Sulfide	MG/L	<1	4	1.4	>1
Total Organic Carbon	MG/L	1	20	10.4	>20

*With nondetections taken at the reporting limit.

TABLE J-3

PRELIMINARY SCORING RESULTS FOR NATURAL ATTENUATION

Appendix J
Table J-3. Preliminary Scoring Results for Natural Attenuation
Study Area 39

Naval Training Center, Orlando
Orlando, FL

Well ID			OLD-39-12A			OLD-39-13B			OLD-39-14C			OLD-39-03A			OLD-39-04A			OLD-39-07B			OLD-39-15	
Sample ID		CRITERIA	39G01201		SCORE	39G01301		SCORE	39G01401		SCORE	39G00303		SCORE	39G00402		SCORE	39G00702		SCORE	39G01501	
Sampling Date			13-May-97			13-May-97			14-May-97			16-May-97			22-May-97			15-May-97			22-May-97	
General Chemistry																						
Alkalinity (total)	MG/L	>2*BK	119		**0**	34		**0**	34		**0**	71		**0**	34		**0**	17		**0**	34	
Carbon dioxide	MG/L	>2*BK	1.2		**0**	NA			50		**0**	40		**1**	45		**1**	50		**1**	100	
Chloride	MG/L	>2*BK	5		**0**	NA			15		**0**	10		**0**	15		**2**	0.1		**0**	20	
Dissolved Iron (II)	MG/L	>1	NA		**0**	0.1		**0**	0.8		**0**	0.1		**0**	0		**0**	0.5		**0**	0.9	
Dissolved Oxygen	MG/L	<0.5	7		**0**	NA			0.8		**0**	3		**0**	0.8		**0**	0.7		**0**	0.8	
Dissolved Oxygen	*MG/L*	***>1***	7		***-3***	NA			*0.8*		***0***	*3*		***-3***	*0.8*		***0***	*0.7*		***0***	*0.8*	
Ethane/Ethene	UG/L	<0.1	0		**0**	0		**0**	0		**0**	0		**0**	0		**0**	NA			0	
Methane	UG/L	>0.1	16		**3**	0		**0**	3		**3**	0		**0**	0		**0**	NA			3	
Nitrate	MG/L	<1	0.6		**2**	0.2	U	**2**	0.2	U	**2**	1.4		**0**	0.3		**2**	0.02	U	**2**	0.02	U
ORP	mV	<50mV	163		**0**	176		**0**	73		**0**	213		**0**	250		**0**	32		**1**	138	
Sulfate	MG/L	<20	5	U	**2**	25	U	**0**	8		**2**	15		**2**	14		**2**	9		**2**	45	
Sulfide	MG/L	>1	1	U	**0**	4		**3**	1	U	**0**	1.8		**3**	1.4		**3**	1	U	**0**	1	U
Total Organic Carbon	MG/L	>20	1		**0**	11		**0**	5		**0**	8		**0**	18		**0**	17		**0**	15	
pH/Temperature		5-9 / >20C			**1**			**1**			**1**			**1**			**1**			**1**		
Presence of TCE*	UG/L		ND		**0**	ND		**0**	ND		**0**	ND		**0**	ND		**0**	0.23		**0**	0.2	
Dissolved Iron	MG/L		0.1			0.3			1			0.1			0.5			0.6			1	
Hydrogen Sulfide	MG/L		0.1			5			0.5			0.1			0			2			0.7	
Nitrite	MG/L		0.2	U		0.2	U		0.2	U		0.02	U		0.02	U		0.02	U		0.02	U
Total Chlorinated Solvents, UG/L			ND			ND			ND			8.6			ND			11.2			1.8	
TOTAL SCORE					**5**			**6**			**8**			**4**			**11**			**7**		

INTERPRETATION OF TOTAL SCORES
0-5 = INADEQUATE EVIDENCE
6-14 = LIMITED EVIDENCE
15-20 = ADEQUATE EVIDENCE
>20 = STRONG EVIDENCE

Appendix J

Table J-3. Preliminary Scoring Results for Natural Attenuation

Study Area 39

Naval Training Center, Orlando

Orlando, FL

Well ID				OLD-39-16C			OLD-39-17A			OLD-39-18B			OLD-39-19C			OLD-39-20A			OLD-39-21B		
Sample ID		CRITERIA	SCORE	39G01601		SCORE	39G01701		SCORE	39G01801		SCORE	39G01901		SCORE	39G02001		SCORE	39G02101		SCORE
Sampling Date				22-May-97			21-May-97			21-May-97			22-May-97			14-May-97			19-May-97		
General Chemistry																					
Alkalinity (total)	MG/L	>2*BK	0	34		0	93		0	34		0	35		0	71		0	50		0
Carbon dioxide	MG/L	>2*BK	1	65		0	50		1	100		1	50		0	60		1	80		1
Chloride	MG/L	>2*BK	2	15		0	15		2	35		2	20		0	10		0	15		2
Dissolved Iron (II)	MG/L	>1	0	0.8		0	0.2		0	0.4		0	0.9		3	0.2		0	0.6		0
Dissolved Oxygen	MG/L	<0.5	0	1		0	1.2		0	1		0	0.8		0	2.4		0	0.8		0
Dissolved Oxygen	*MG/L*	*>1*	*0*	*1*		*0*	*1.2*		*-3*	*1*		*0*	*0.8*		*0*	*2.4*		*-3*	*0.8*		*0*
Ethane/Ethene	UG/L	<0.1	0	0		0	0		0	0		0	0		0	0		0	0		0
Methane	UG/L	>0.1	3	3		3	13		3	0		0	8		3	0		0	2	J	3
Nitrate	MG/L	<1	2	0.07		2	9.1		0	0.07		2	0.02		2	NA		0	0.02	U	2
ORP	mV	<50mV	0	40		1	177		0	107		0	61		0	255		0	70		0
Sulfate	MG/L	<20	0	14		2	41		0	64		0	16		2	NA		0	17		2
Sulfide	MG/L	>1	0	1.2		3	1	U	0	1.2		3	1	U	0	NA		3	1.8		3
Total Organic Carbon	MG/L	>20	0	2		0	11		0	8		0	15		0	NA		2	20		0
pH/Temperature		5-9 / >20C	1			1			1			1			1			1			1
Presence of TCE*	UG/L		0	0.6		2	ND		0	0.5		2	0.6		2	ND		0	ND		0
Dissolved Iron	MG/L			0.9			0.2			0.5			1.1			0.4			0.7		
Hydrogen Sulfide	MG/L			5			0			0.5			5			0			0.7		
Nitrite	MG/L			0.02	U		0.08			0.02	U		0.02	U		NA			0.02		
Total Chlorinated Solvents, UG/L				12.6			0.8			9.8			27.6			ND			1.3		
TOTAL SCORE			9			14			4			11			13			4			14

INTERPRETATION OF TOTAL SCORES

0-5 = INADEQUATE EVIDENCE

6-14 = LIMITED EVIDENCE

15-20 = ADEQUATE EVIDENCE

>20 = STRONG EVIDENCE

Appendix J
Table J-3. Preliminary Scoring Results for Natural Attenuation
Study Area 39

Naval Training Center, Orlando
Orlando, FL

Well ID			OLD-39-22C			OLD-39-23A			OLD-39-24B			OLD-39-25C			OLD-39-26C		
Sample ID		CRITERIA	39G02201		SCORE	39G02301		SCORE	39G02401		SCORE	39G02501		SCORE	39G02601		SCORE
Sampling Date			19-May-97			14-May-97			14-May-97			15-May-97			15-May-97		
General Chemistry																	
Alkalinity (total)	MG/L	>2*BK	51		**0**	170		**0**	34		**0**	50		**0**	34		**0**
Carbon dioxide	MG/L	>2*BK	40		**0**	125		**1**	NA		**1**	80		**0**	50		**0**
Chloride	MG/L	>2*BK	15		**0**	20		**2**	30		**2**	45		**2**	15		**0**
Dissolved Iron (II)	MG/L	>1	0.7		**0**	0.1		**0**	0.8		**0**	1		**0**	0.6		**0**
Dissolved Oxygen	MG/L	<0.5	0.3		**3**	3.7		**0**	1.5		**0**	0.7		**0**	0.6		**0**
Dissolved Oxygen	*MG/L*	***>1***	*0.3*		***0***	*3.7*		***-3***	*1.5*		***-3***	*0.7*		***0***	*0.6*		***0***
Ethane/Ethene	UG/L	<0.1	0		**0**	0		**0**	0		**0**	0		**0**	0		**0**
Methane	UG/L	>0.1	12		**3**	2	J	**3**	4		**3**	2	J	**3**	5		**3**
Nitrate	MG/L	<1	0.02	U	**2**	3.6		**0**	0.02	U	**2**	0.02	U	**2**	0.02	U	**2**
ORP	mV	<50mV	58		**0**	138		**0**	10		**1**	17		**1**	22		**1**
Sulfate	MG/L	<20	14		**2**	34		**0**	43		**0**	10		**2**	13		**2**
Sulfide	MG/L	>1	1		**0**	1		**0**	2		**3**	1	U	**0**	1	U	**0**
Total Organic Carbon	MG/L	>20	4		**0**	13		**0**	11		**0**	3		**0**	14		**0**
pH/Temperature		5-9 / >20C			**1**			**1**			**1**			**1**			**1**
Presence of TCE*	UG/L		ND		**0**	ND		**0**	ND		**0**	ND		**0**	ND		**0**
Dissolved Iron	MG/L		0.8			0.1			0.6			1			0.8		
Hydrogen Sulfide	MG/L		2			0.3			5			2			20		
Nitrite	MG/L		0.02	U		0.2	U		0.04			0.02	U		0.02	U	
Total Chlorinated Solvents, UG/L			0.4			ND			ND			ND			ND		
TOTAL SCORE					**11**			**4**			**10**			**11**			**9**

INTERPRETATION OF TOTAL SCORES
0-5 = INADEQUATE EVIDENCE
6-14 = LIMITED EVIDENCE
15-20 = ADEQUATE EVIDENCE
>20 = STRONG EVIDENCE

Appendix J

Table J-3. Preliminary Scoring Results for Natural Attenuation

Study Area 39

Naval Training Center, Orlando

Orlando, FL

NOTES:

Analytical results expressed in milligrams per liter (MG/L), micrograms per liter (UG/L) OR millivolts (mV).
U = Analyte not detected at the reporting limit. Number preceding the U qualifier is the reporting limit.
J = Analyte concentration is an estimated quantity.
NA = Not analyzed.
ND = Not detected.
ID = Identifier
BK = Background. Upgradient wells OLD-39-12A, OLD-39-13B, and OLD-39-14C are utilized as background wells for this evaluation (shaded columns in Table J-3).

APPENDIX K

HYDRAULIC CONDUCTIVITY TESTING RESULTS
SUPPLEMENTAL SCREENING (PHASE II)

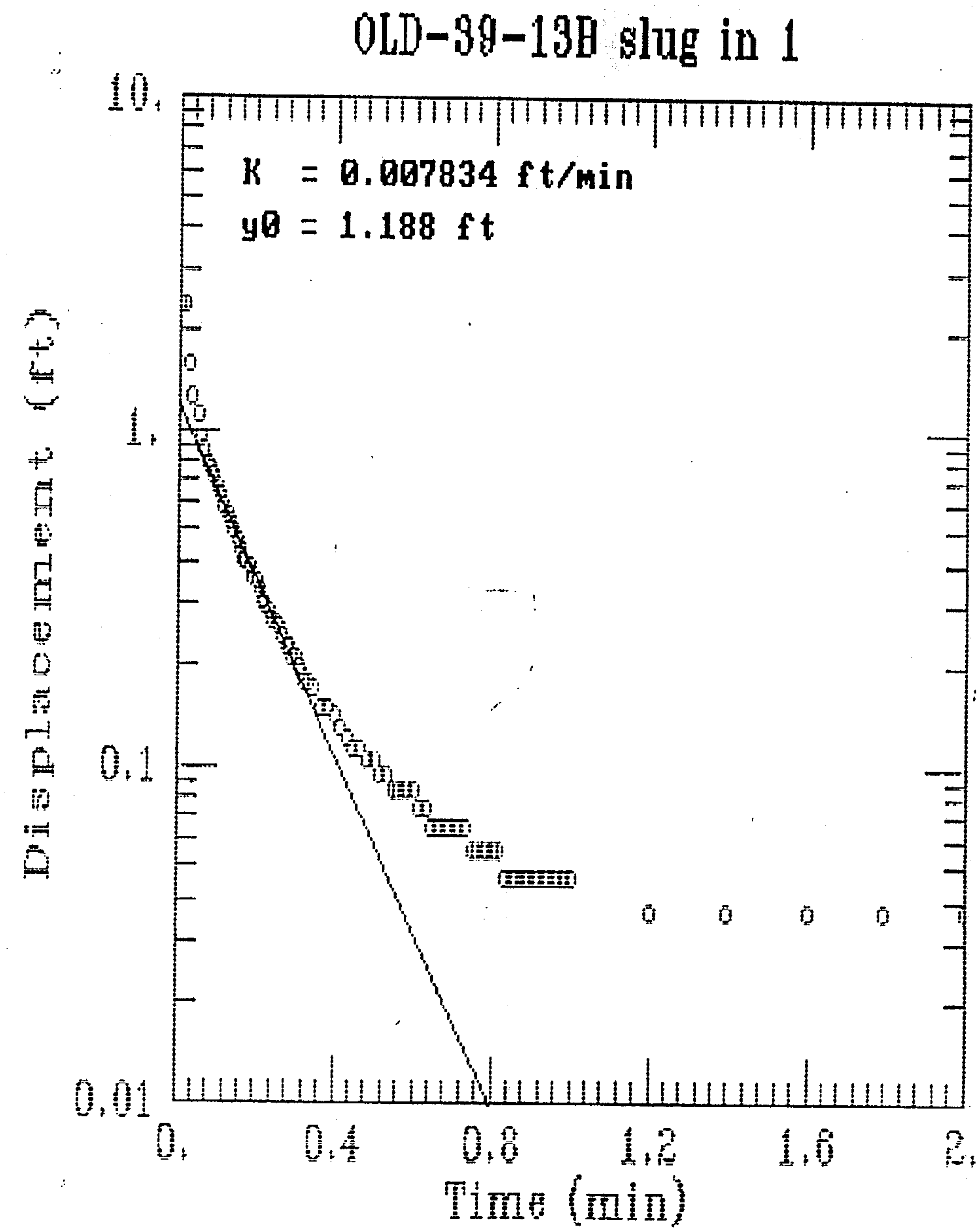
Table K-1
Summary of Hydraulic Conductivity Results

Base Realignment and Closure
Environmental Site Screening Report
Study Area 39
Naval Training Center
Orlando, Florida

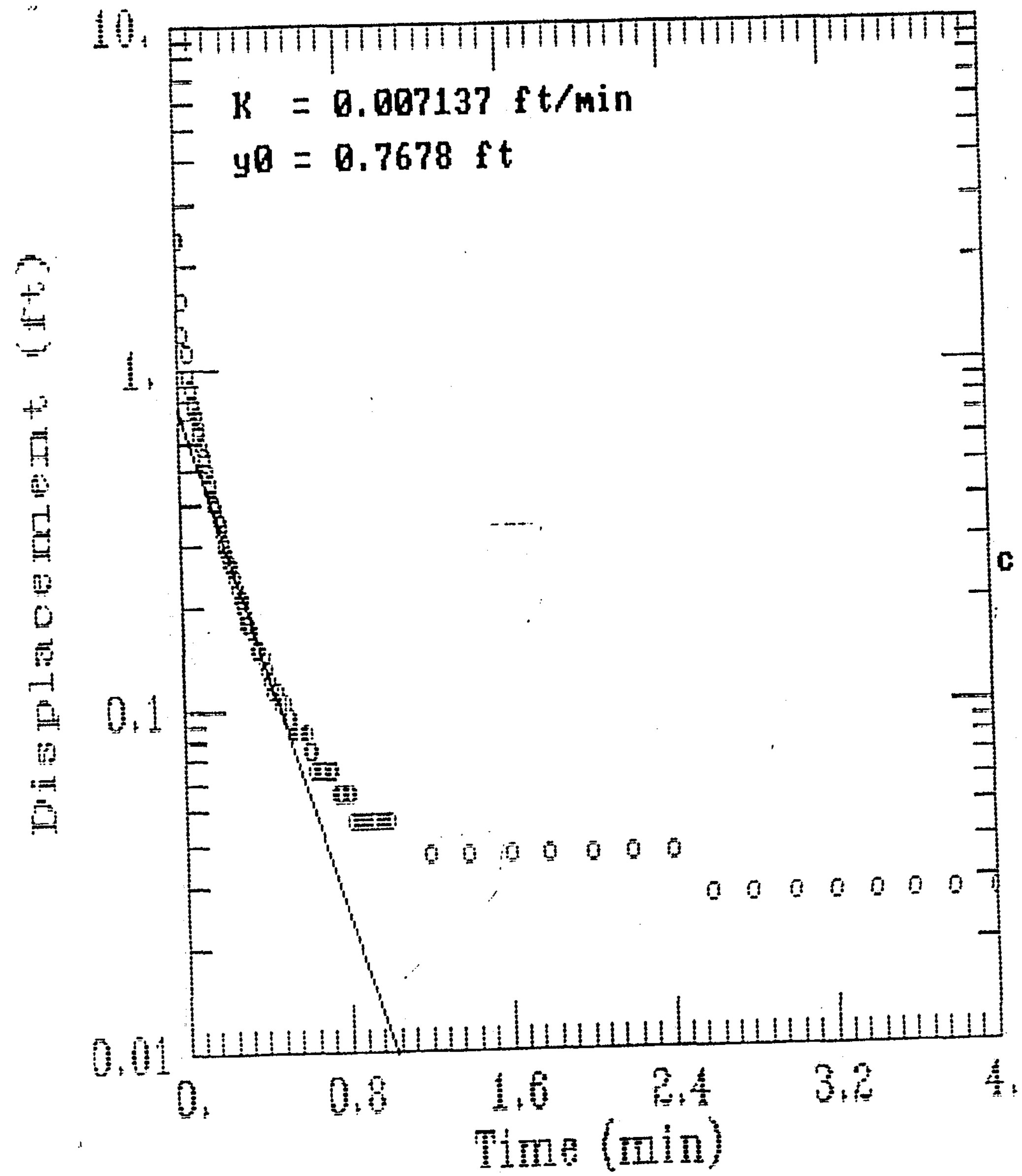
Monitoring Well ID	Hydraulic Conductivity Results				Groundwater Flow Rate[1] Ft/Day
	Slug In/Out	Ft/Min	Ft/Day	Cm/Sec	
Shallow Wells:					
OLD-39-23A	Out	2×10^{-3}	2.88	1.0×10^{-3}	0.024
Intermediate Wells:					
OLD-39-21B	Out	4.0×10^{-3}	5.76	2.0×10^{-3}	0.048
OLD-39-24B	Out	3.0×10^{-3}	4.34	1.5×10^{-3}	0.036
Geometric Mean:		3.5×10^{-3}	5.03	1.8×10^{-3}	0.042
Average:		3.5×10^{-3}	5.01	1.8×10^{-3}	0.041
Deep Wells:					
OLD-39-16C	Out	4.0×10^{-3}	5.76	2.0×10^{-3}	0.048
OLD-39-22C	Out	$2.0 \times 10^{-}$	2.88	1.0×10^{-3}	0.024
OLD-39-25C	Out	1.6×10^{-3}	2.30	0.8×10^{-3}	0.019
Average:		2.5×10^{-3}	3.60	1.3×10^{-3}	0.030
Geometric Mean:		2.3×10^{-3}	3.30	1.3×10^{-3}	0.028
Total Average:		$\mathbf{2.86 \times 10^{-3}}$	4.11	1.45×10^{-3}	0.034
Total Geometric Mean:		$\mathbf{2.82 \times 10^{-3}}$	4.07	1.43×10^{-3}	0.033

Notes: Groundwater flow rate calculated with the following formula: $V=Ki/p$, where K is the hydraulic conductivity, i is the average gradient, and p is an assumed porosity value of .30 (unitless).

ID = identification.
ft/min = feet per minute.
ft/day = feet per day.
cm/sec = centimeters per second.

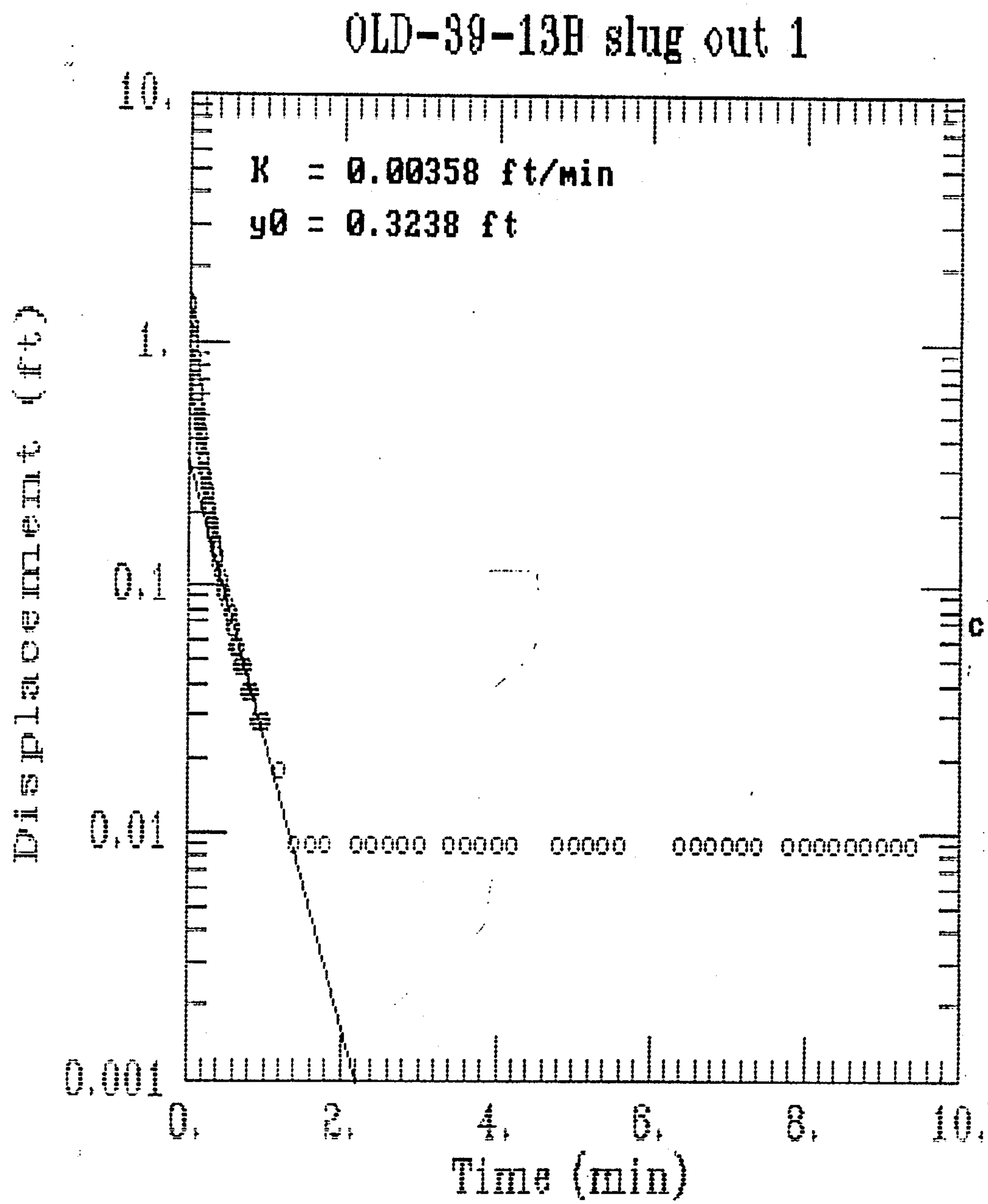

OLD-39-13B slug in 1
K = 0.007834 ft/min
y0 = 1.188 ft
Displacement (ft)
10.
1.
0.1
0.01
0.
0.4
0.8
1.2
1.6
2.
Time (min)

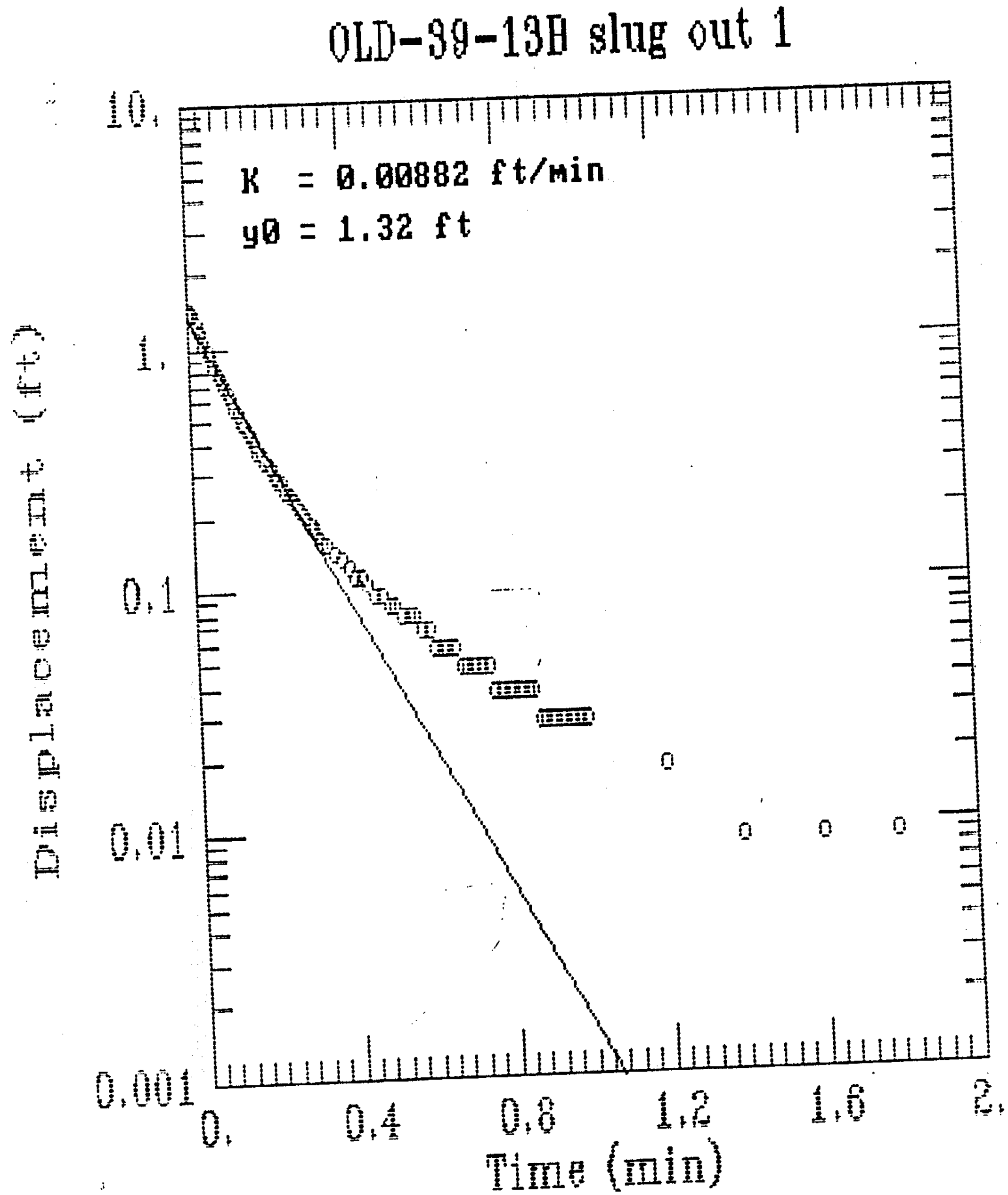
OLD-39-13B slug in 1



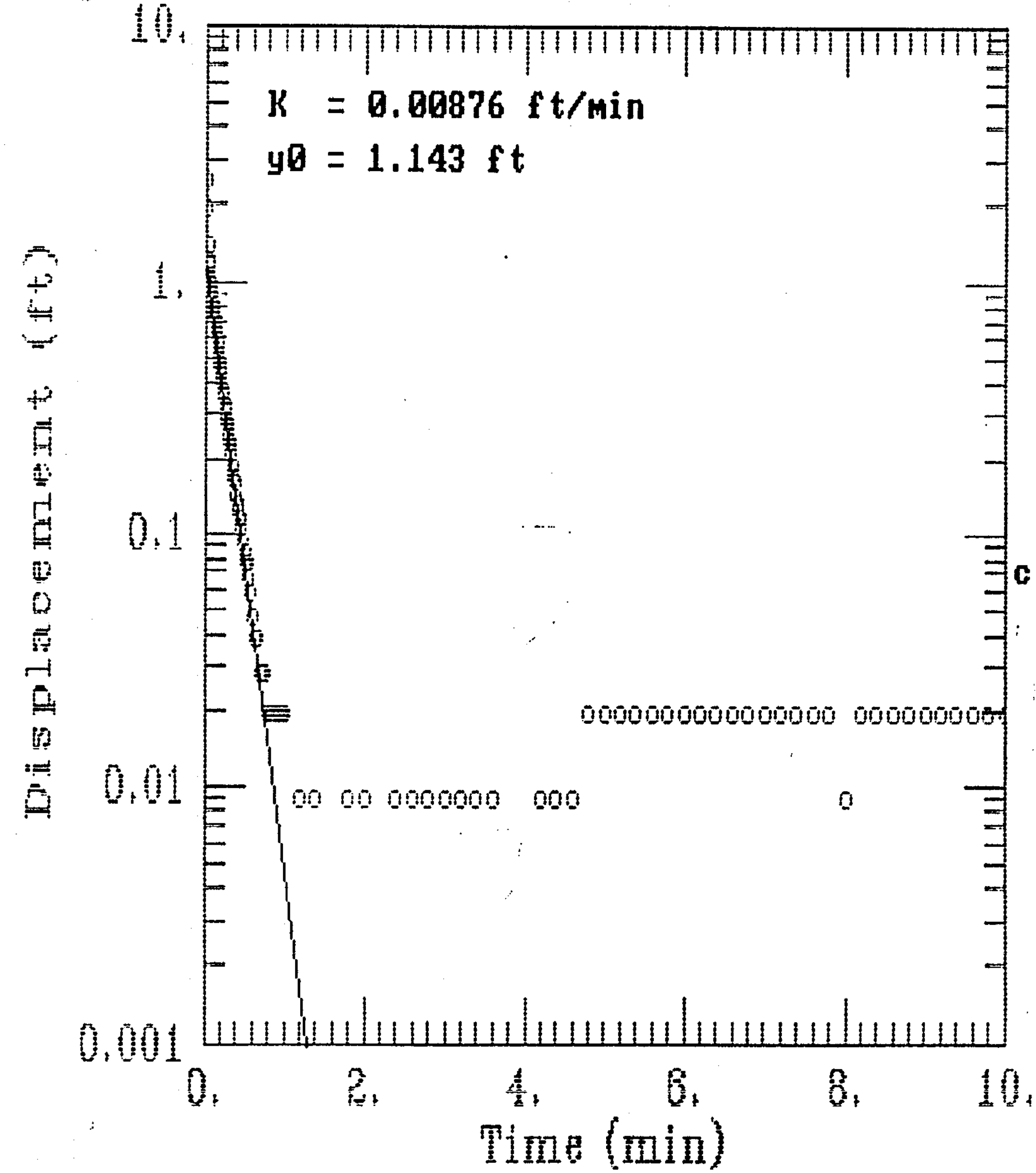
c:

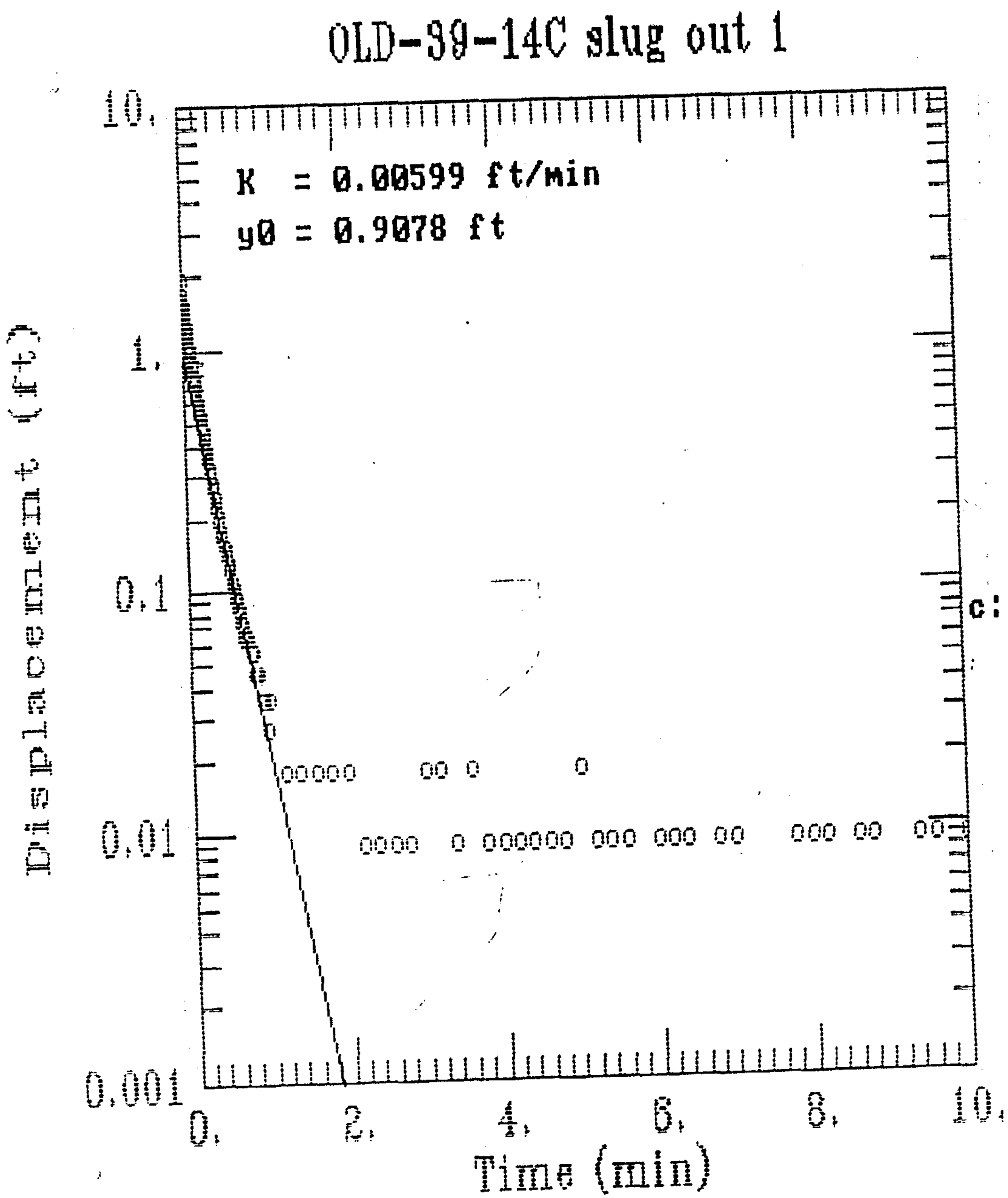
at


OLD-39-13B slug out 1
K = 0.00358 ft/min
y0 = 0.3238 ft
10.
1.
0.1
0.01
0.001
Displacement (ft)
0.
2.
4.
6.
8.
10.
Time (min)
c:
at

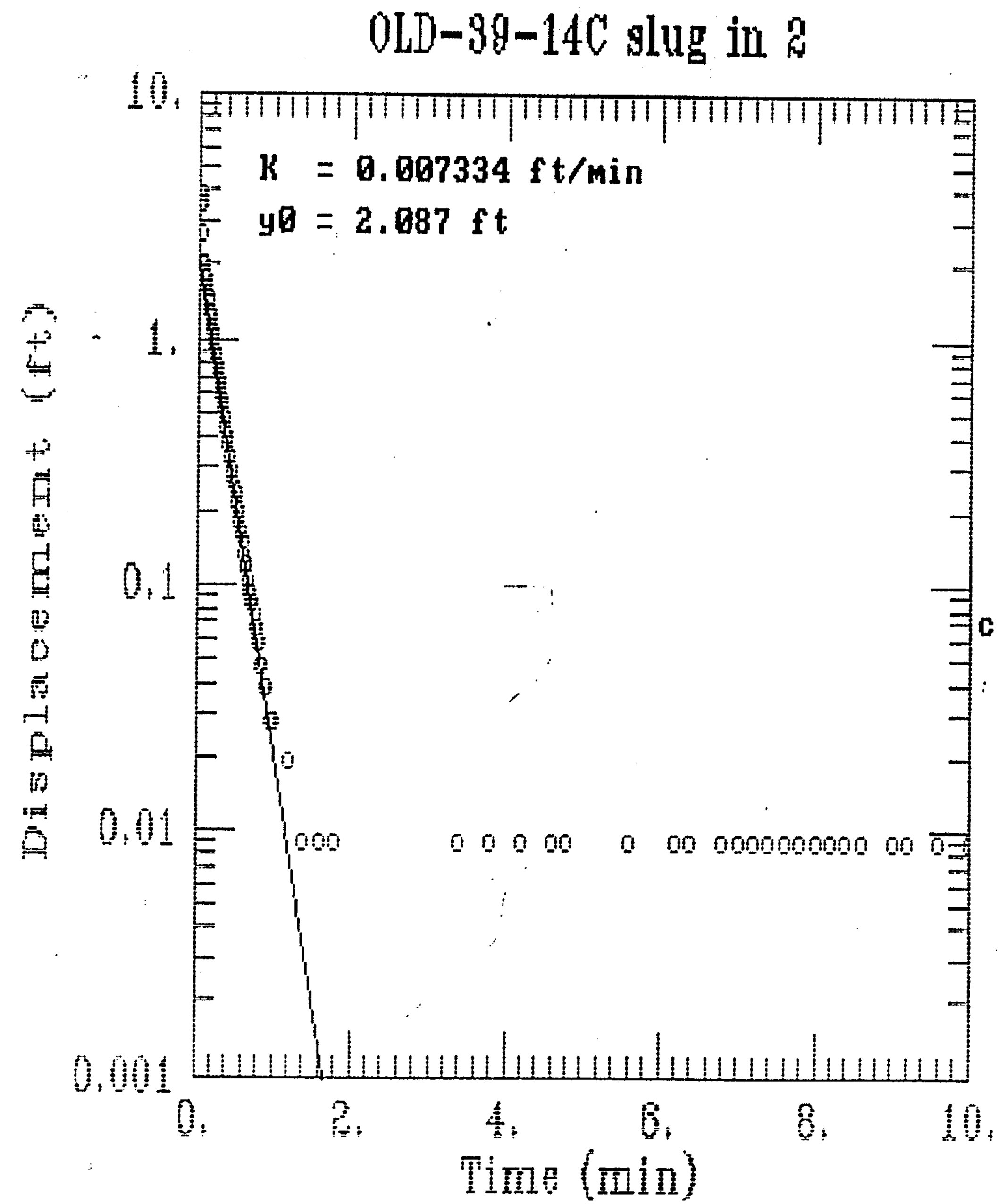

OLD-39-13B slug out 1
K = 0.00882 ft/min
y0 = 1.32 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.4
0.8
1.2
1.6
2.
Time (min)

OLD-39-14 slug in 1



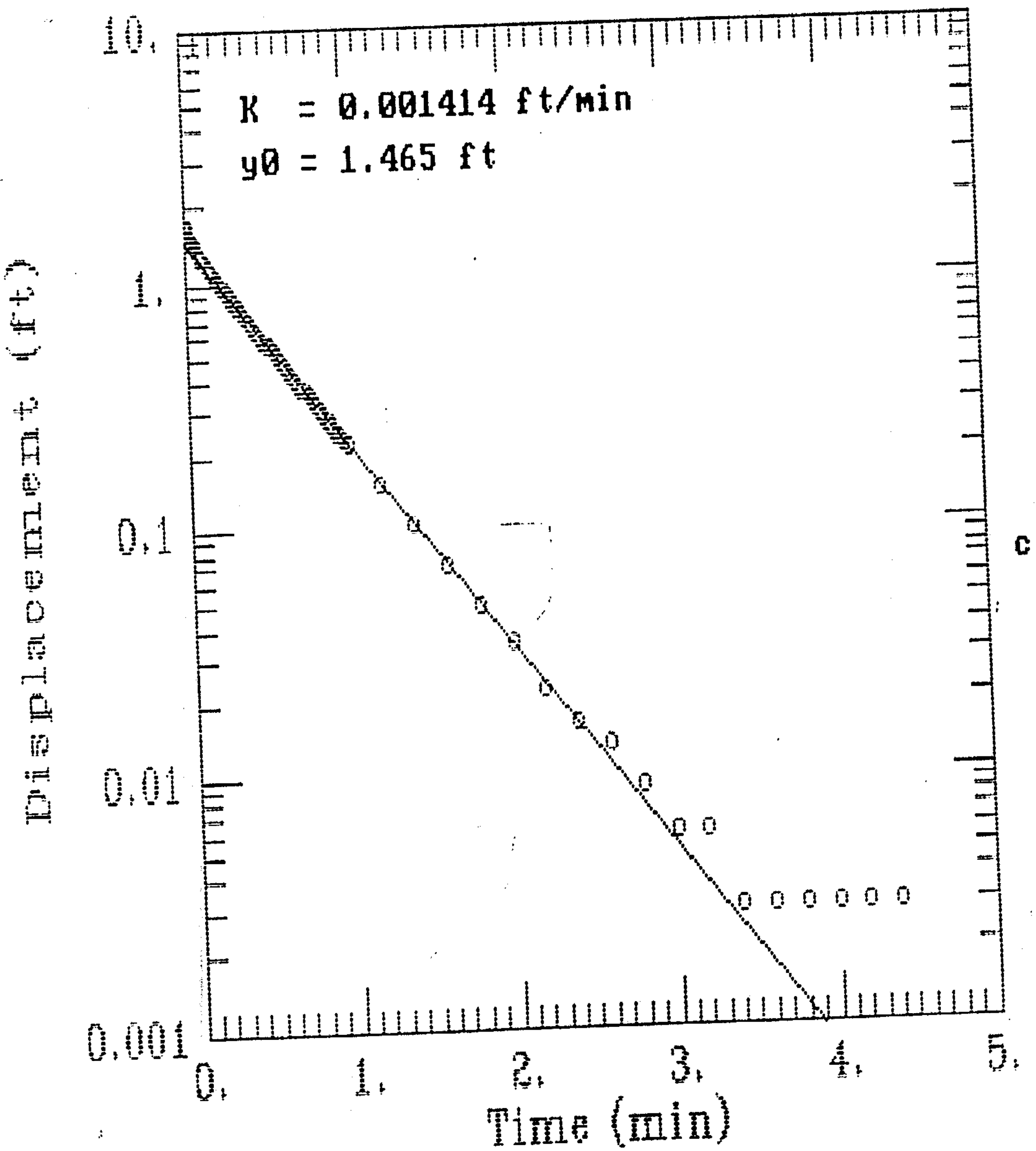


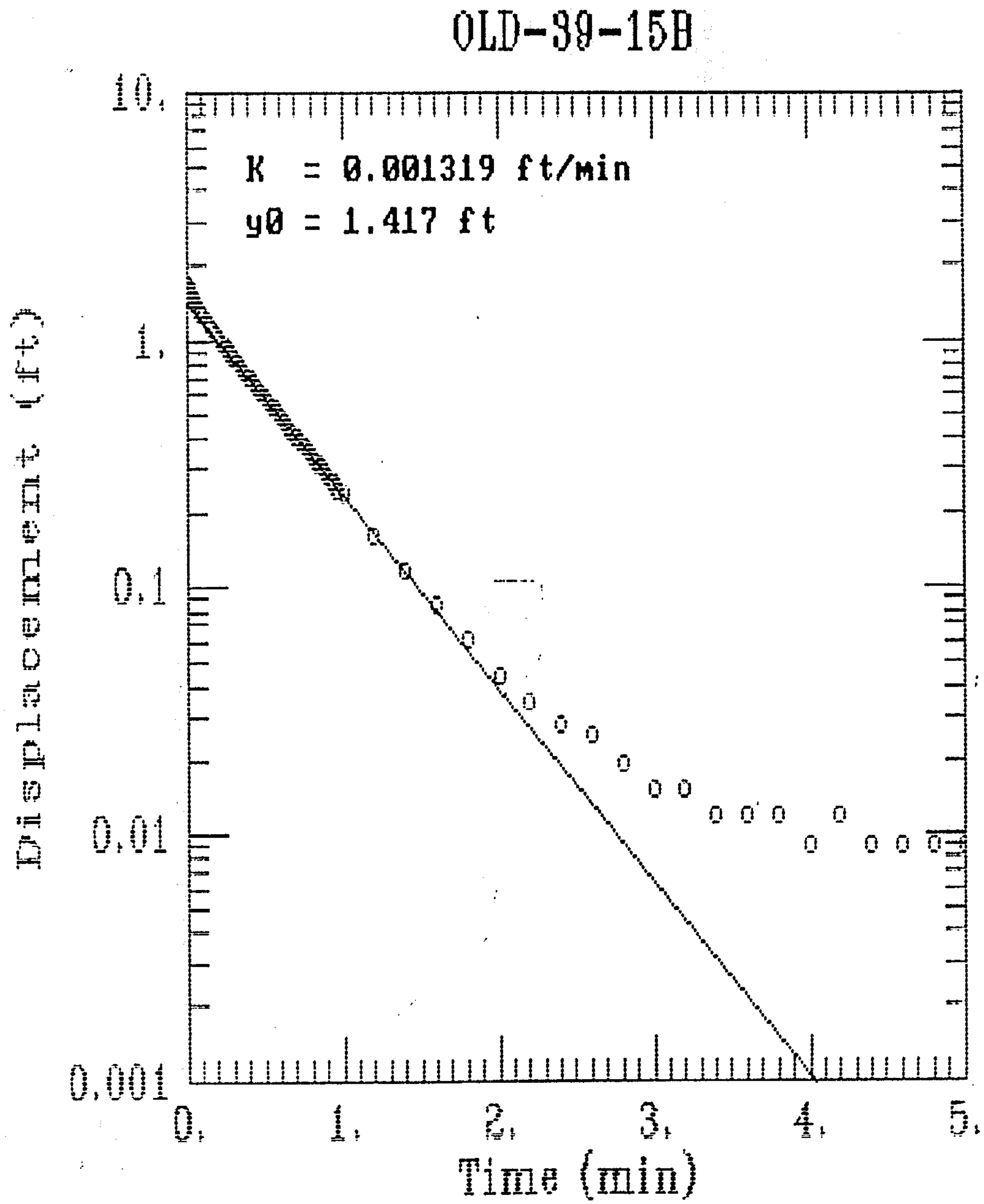
OLD-39-14C slug out 1
K = 0.00599 ft/min
y0 = 0.9078 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
2.
4.
6.
8.
10.



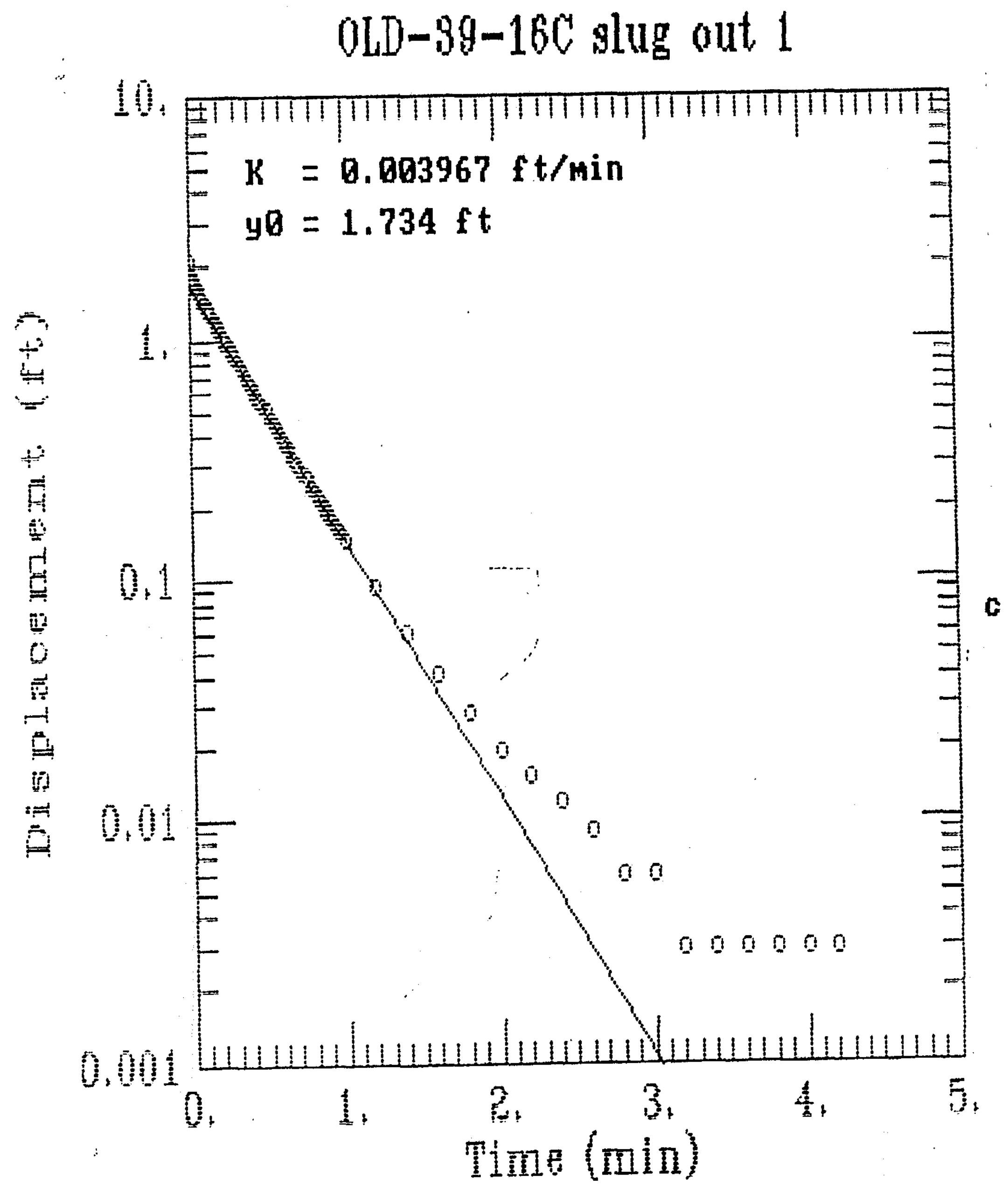
OLD-39-14C slug in 2
K = 0.007334 ft/min
y0 = 2.087 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
2.
4.
6.
8.
10.

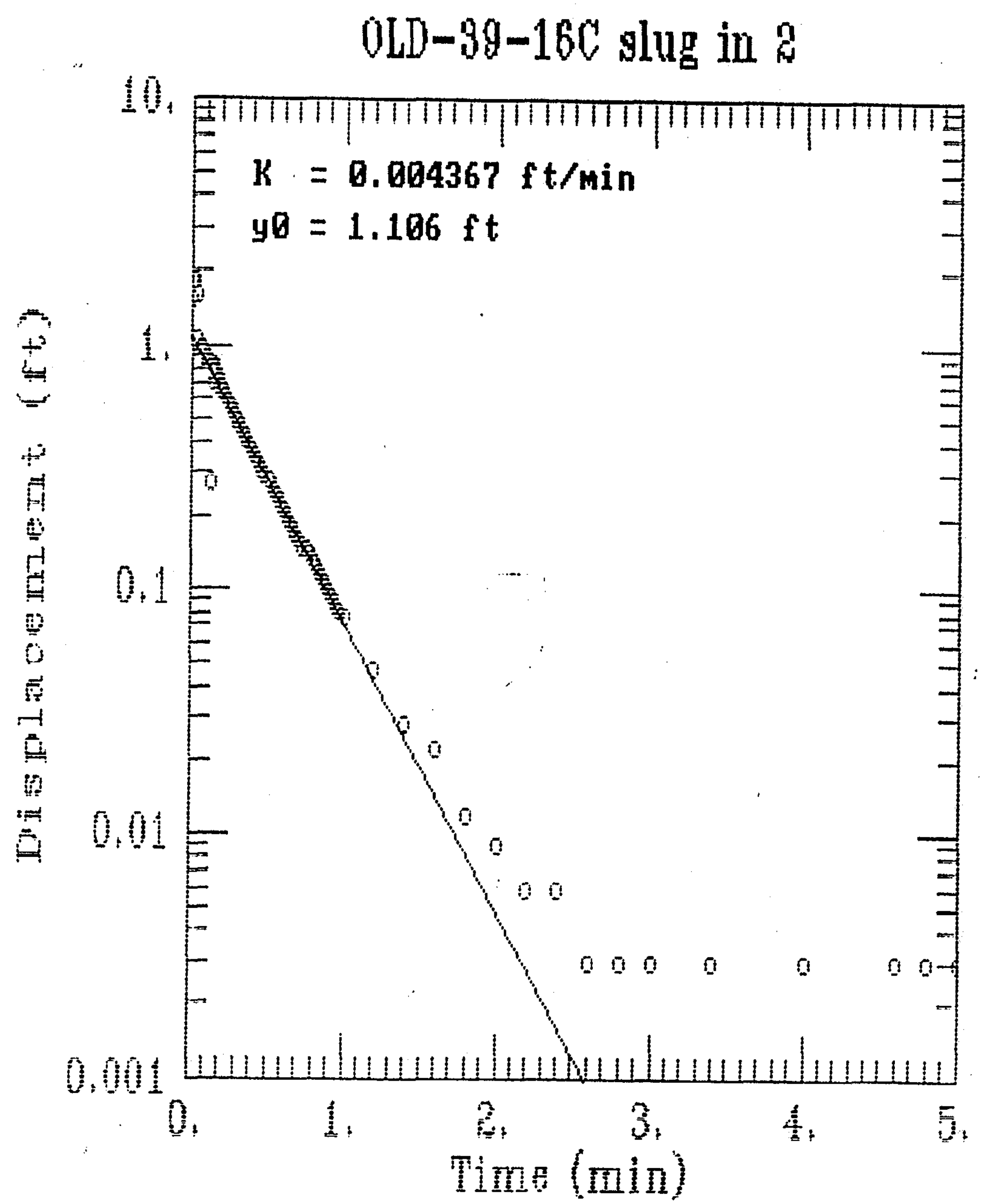
OLD-39-15B


K = 0.001414 ft/min
y0 = 1.465 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)



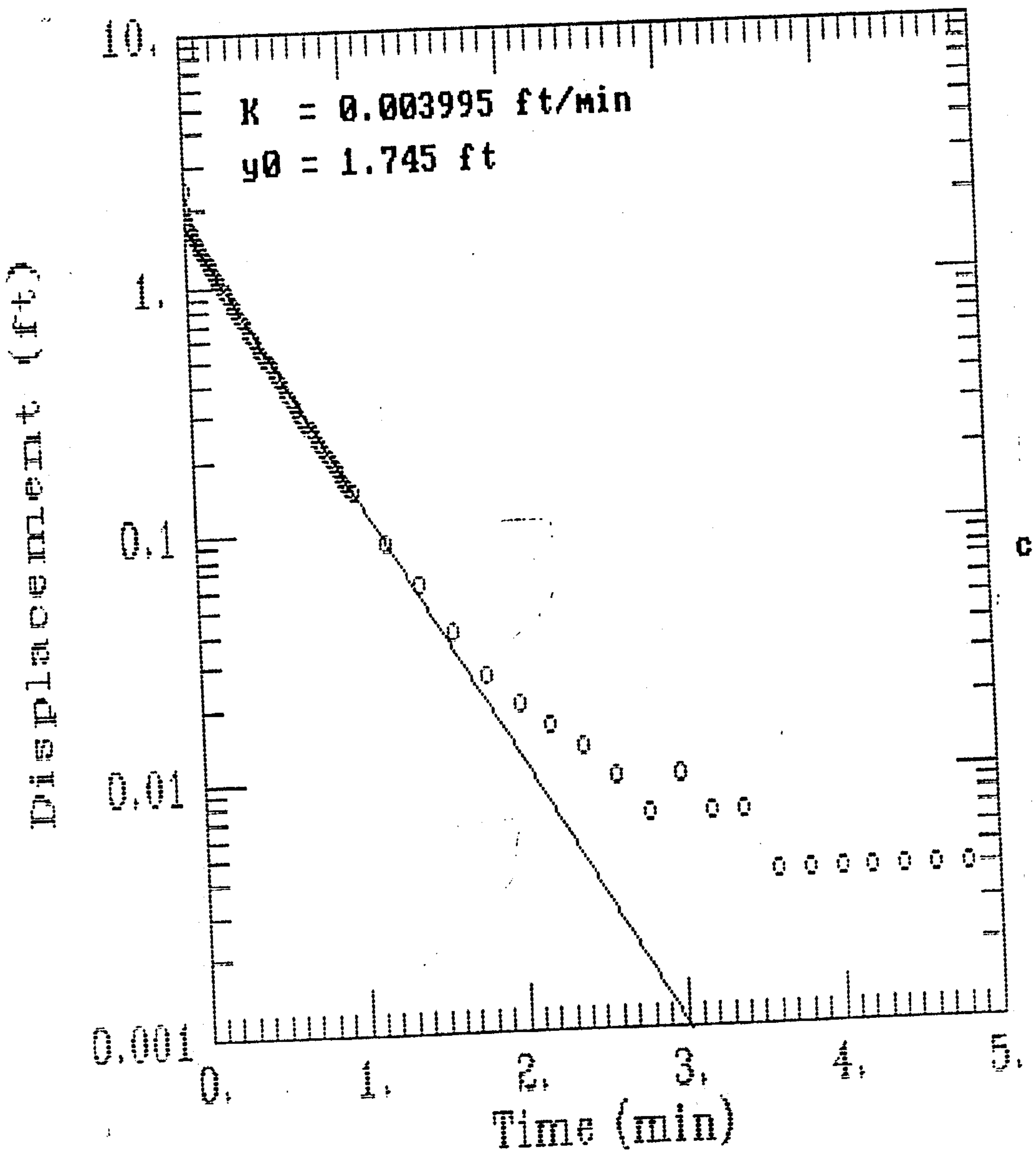
OLD-39-15B
K = 0.001319 ft/min
y0 = 1.417 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.

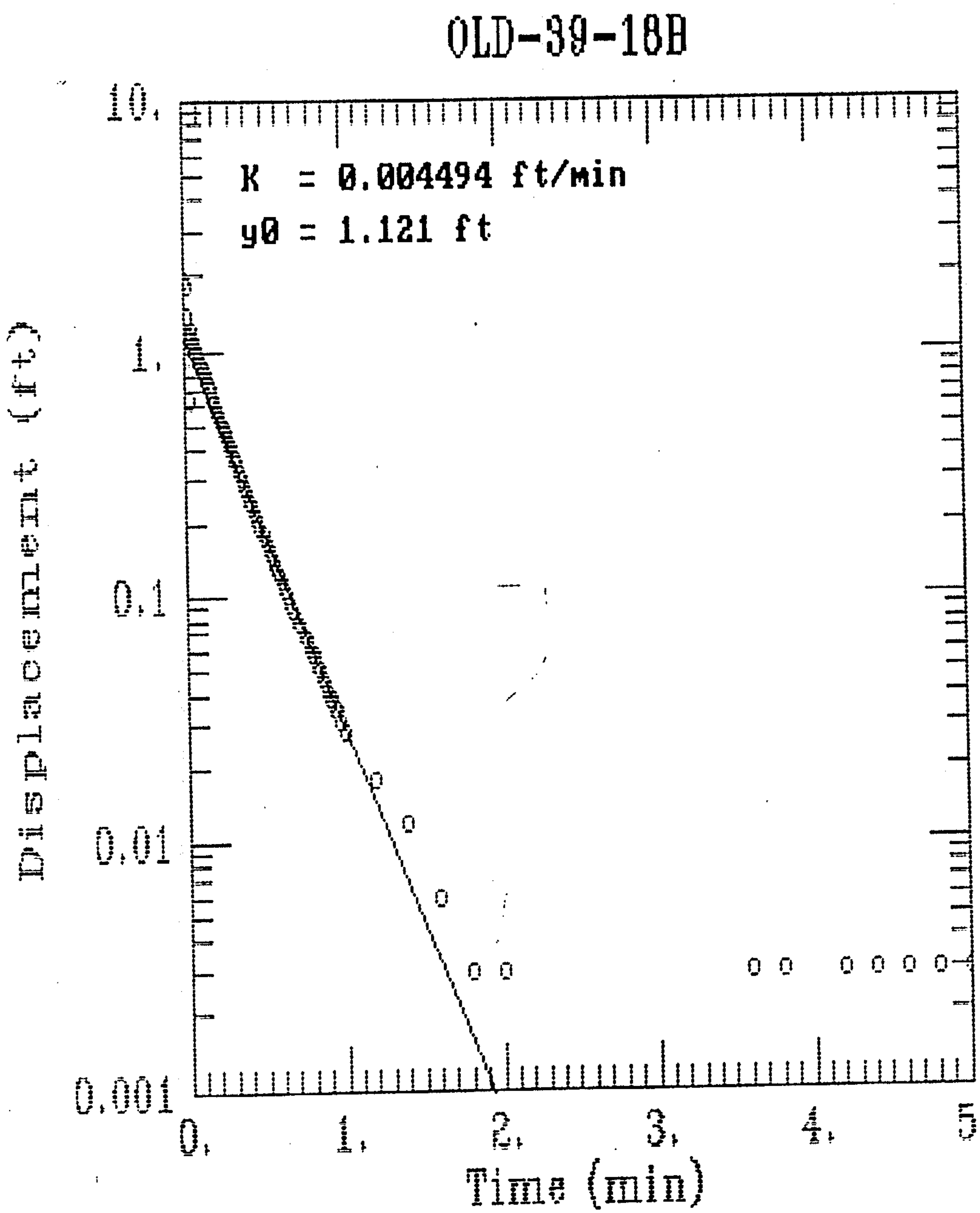

OLD-39-16C slug out 1
K = 0.003967 ft/min
y0 = 1.734 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.



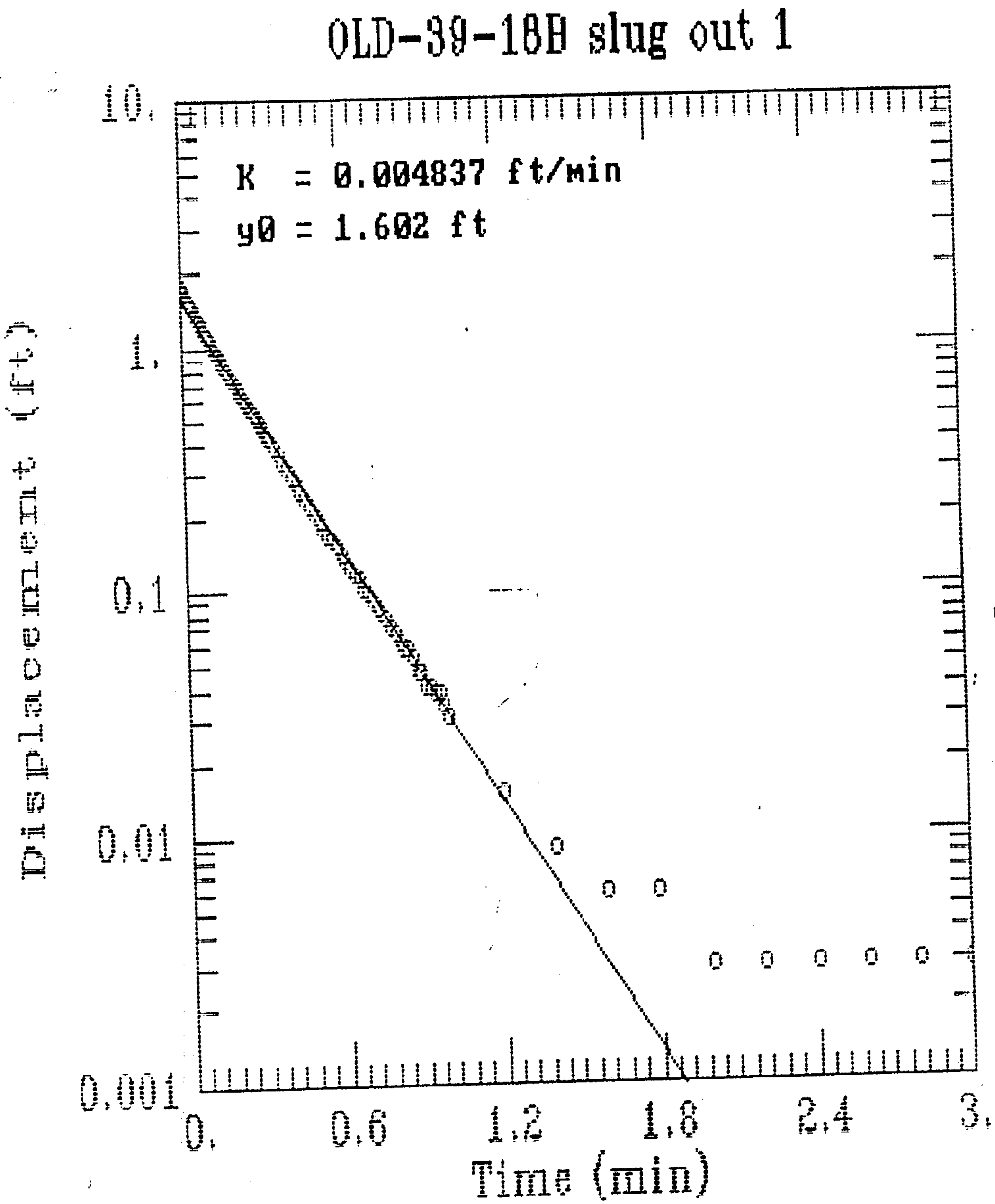
OLD-39-16C slug in 2
K = 0.004367 ft/min
y0 = 1.106 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)

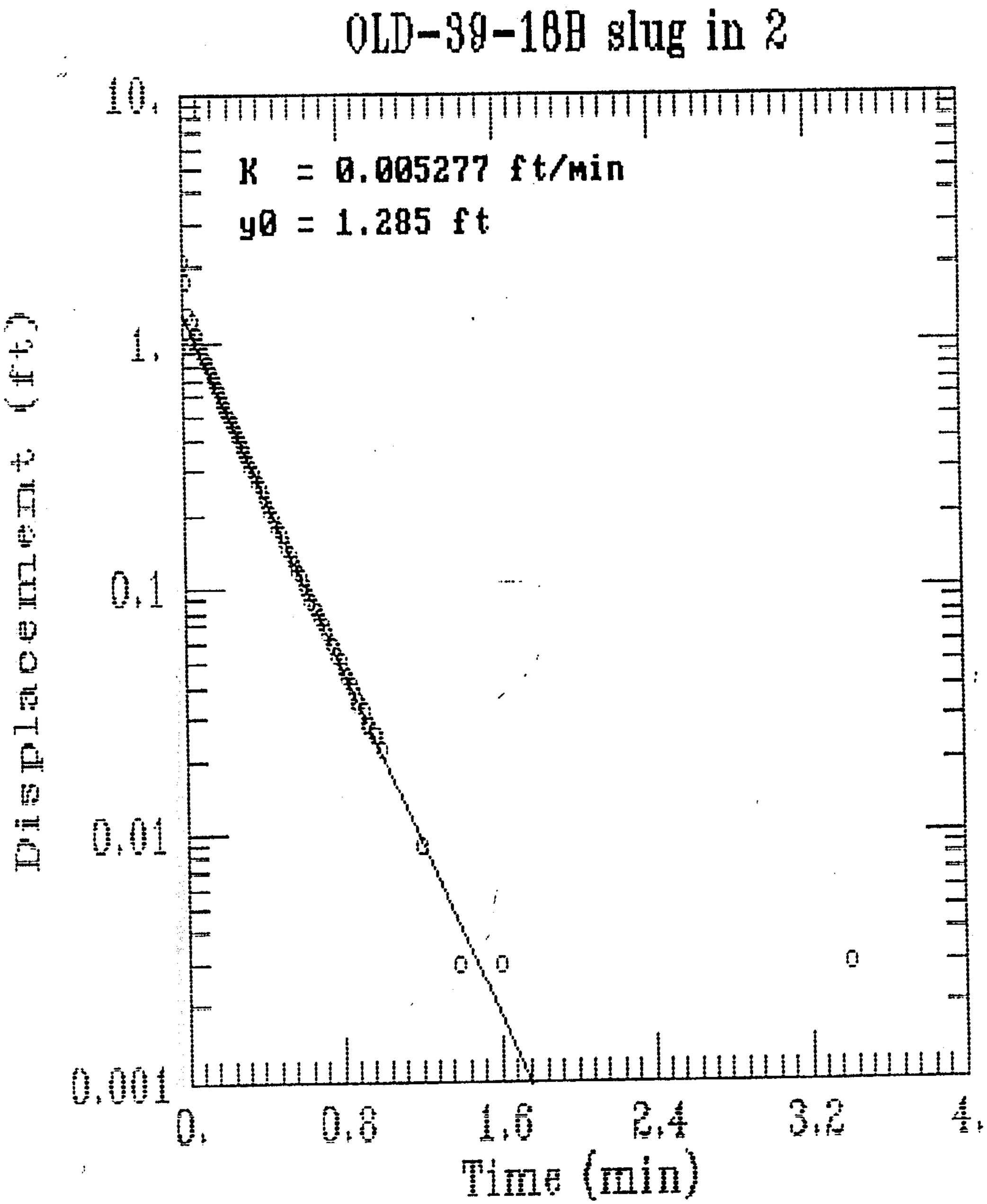
OLD-3916C slug out 2



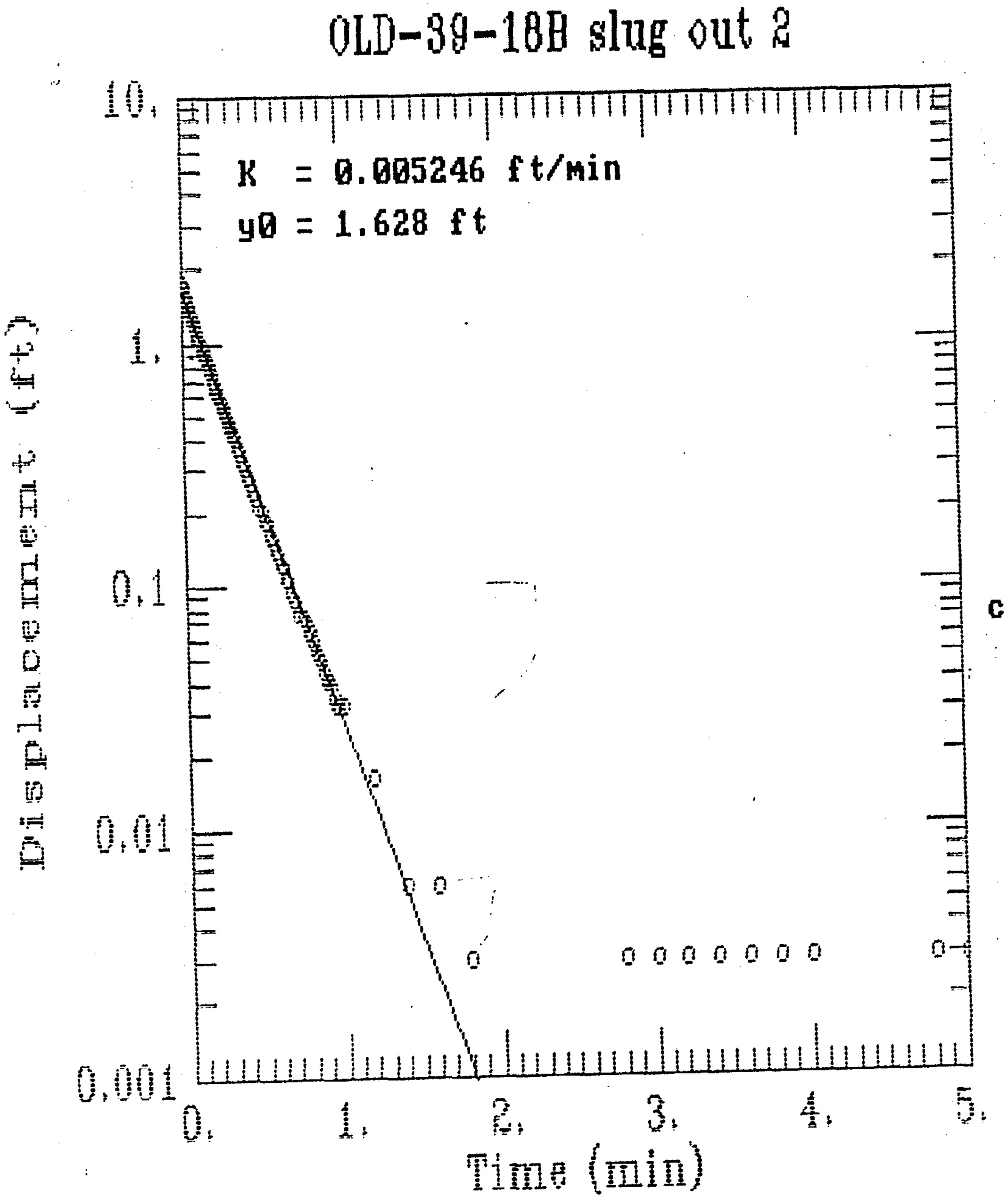


OLD-39-18B
K = 0.004494 ft/min
y0 = 1.121 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)

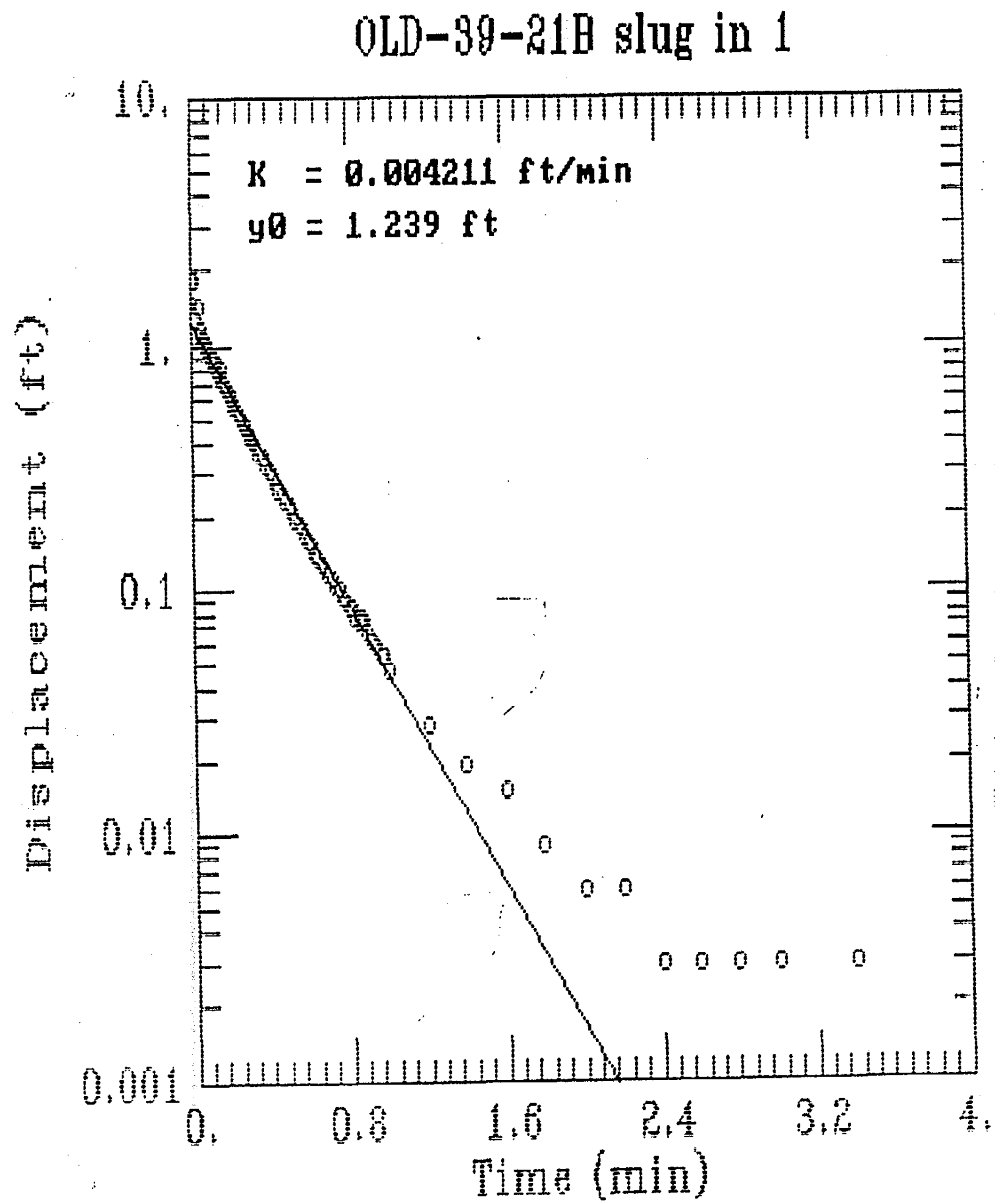

OLD-39-18B slug out 1
K = 0.004837 ft/min
y0 = 1.602 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.6
1.2
1.8
2.4
3.
Time (min)

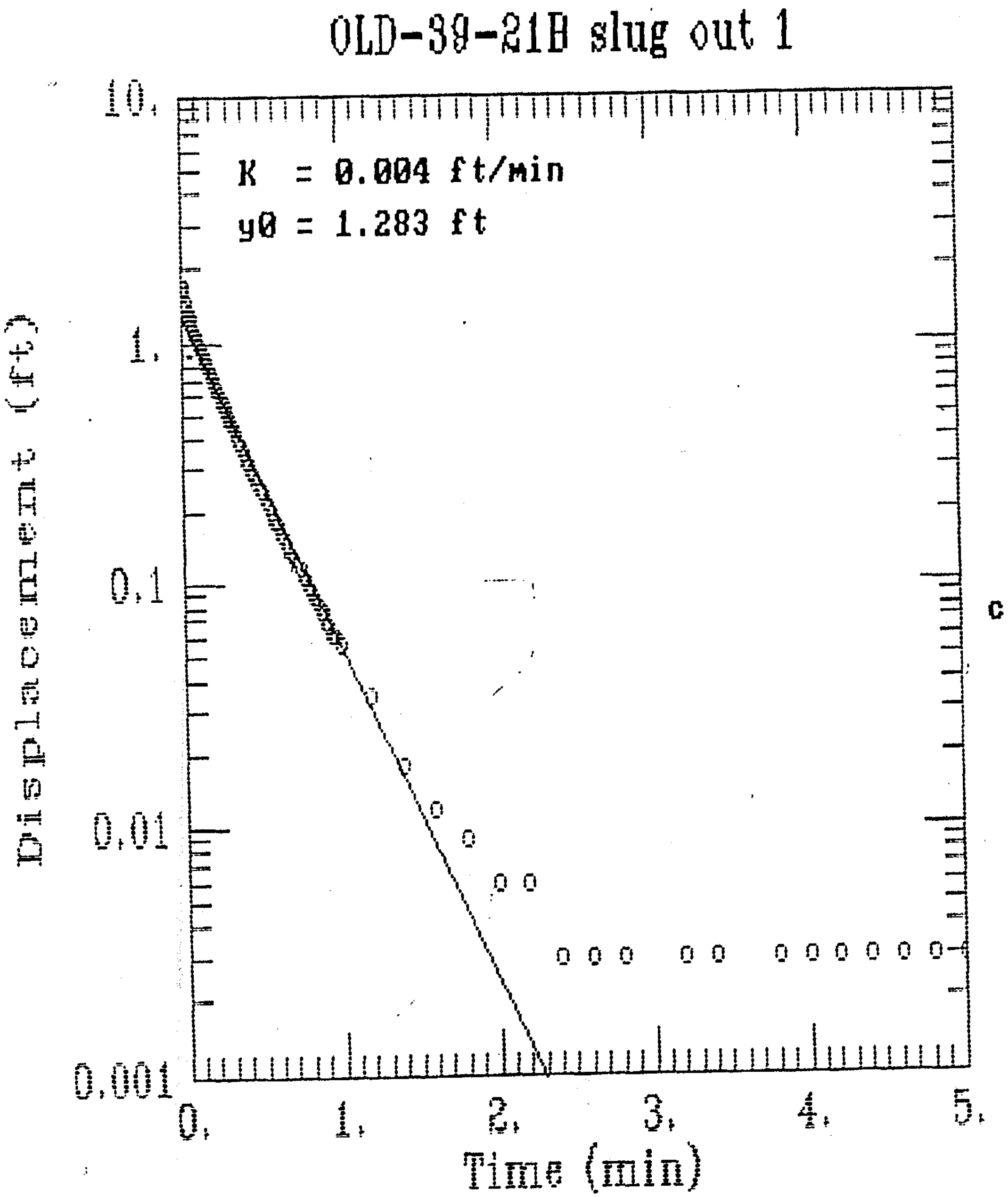


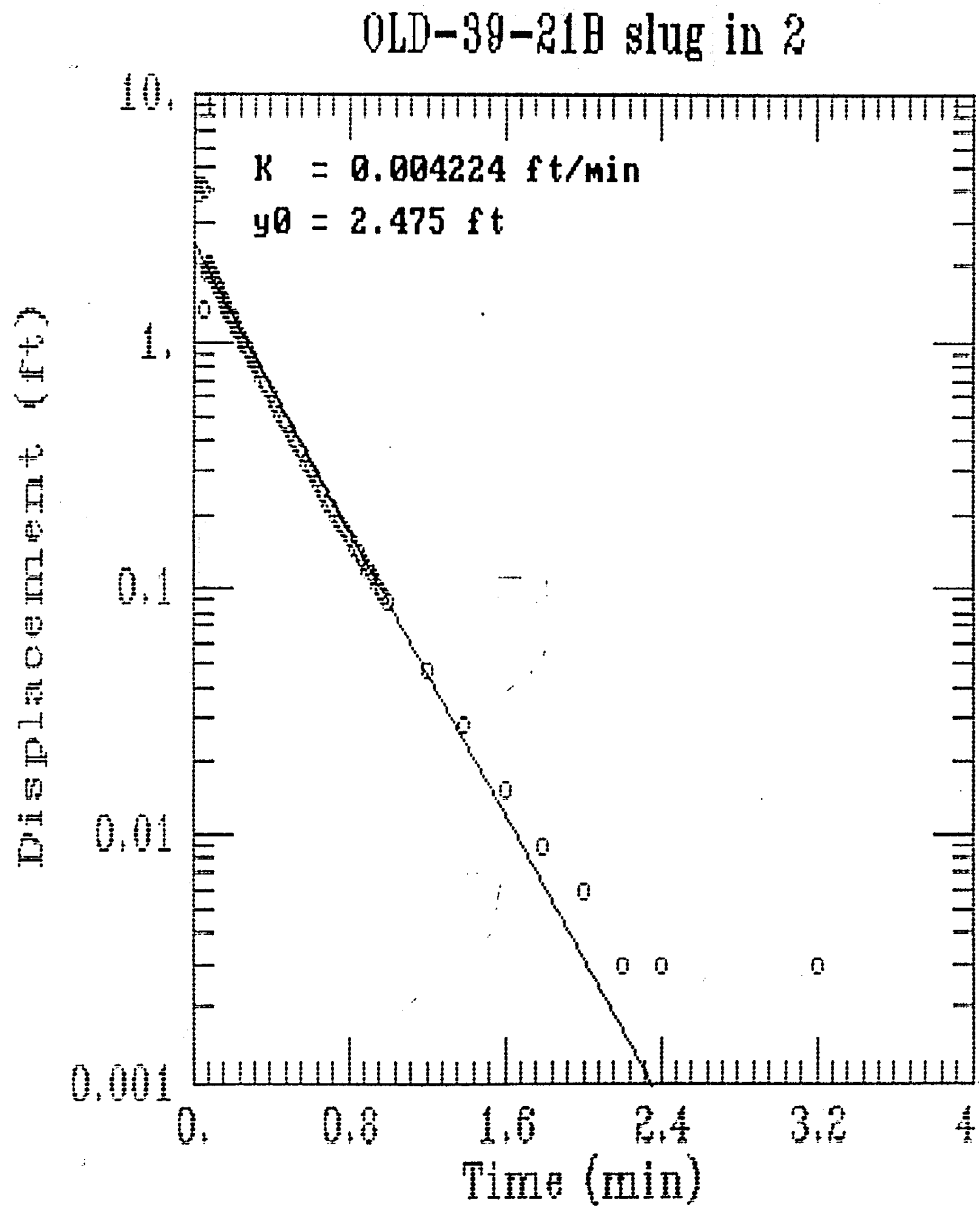
OLD-39-18B slug in 2
K = 0.005277 ft/min
y0 = 1.285 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.8
1.6
2.4
3.2
4.
Time (min)

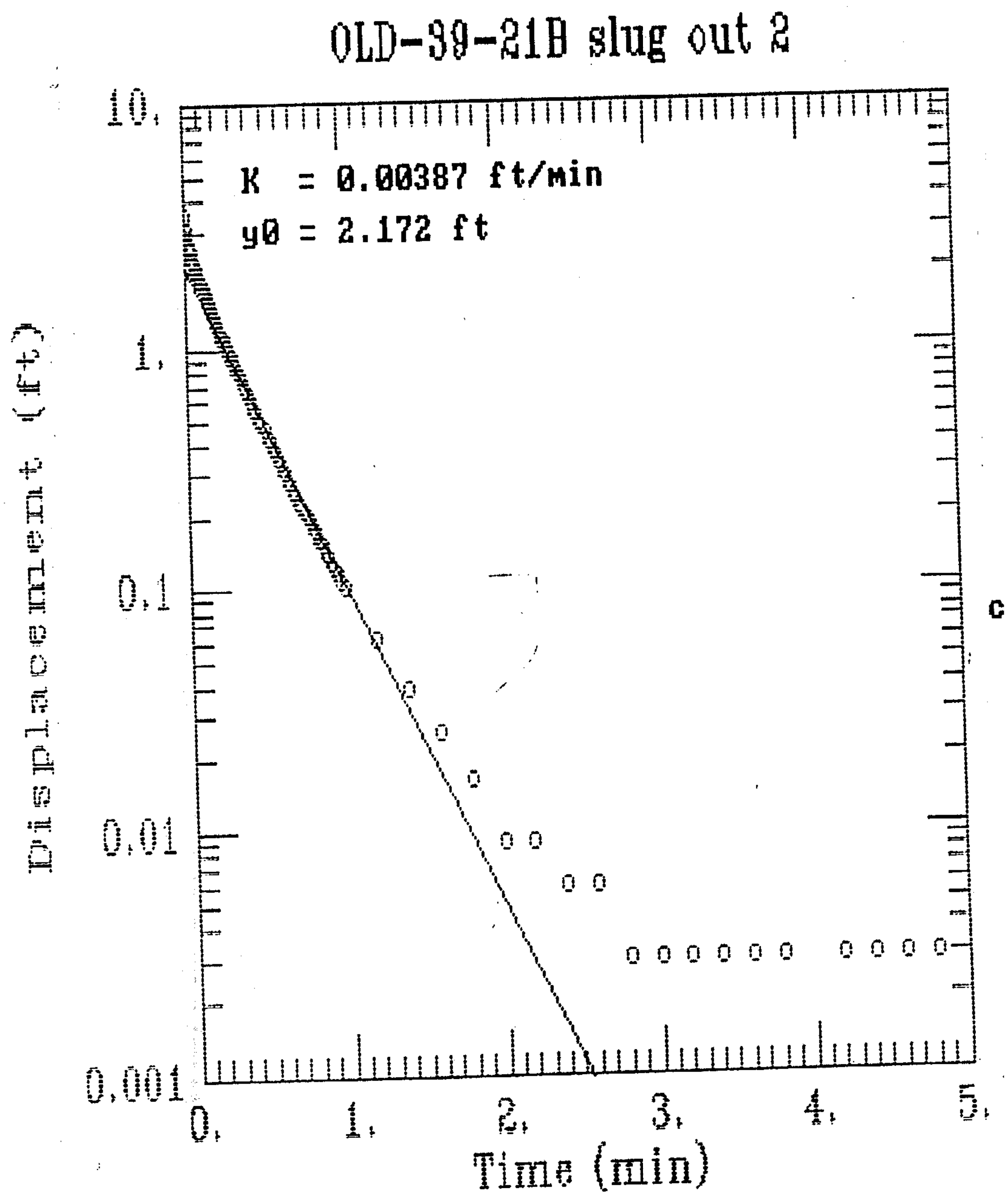


OLD-39-18B slug out 2
K = 0.005246 ft/min
y0 = 1.628 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)


OLD-39-21B slug in 1
K = 0.004211 ft/min
y0 = 1.239 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.8
1.6
2.4
3.2
4.
Time (min)

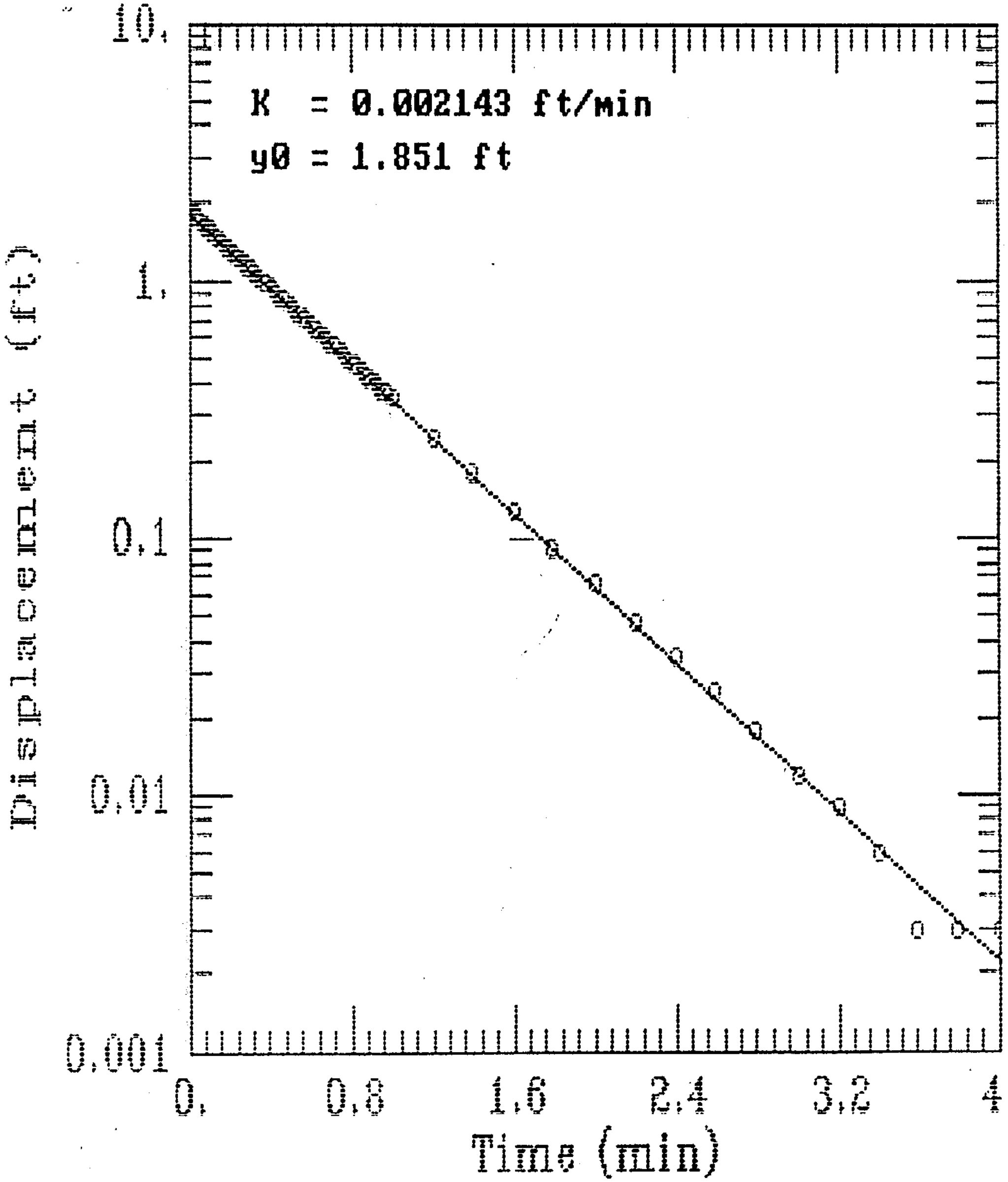

OLD-39-21B slug out 1
K = 0.004 ft/min
y0 = 1.283 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)


OLD-39-21B slug in 2
K = 0.004224 ft/min
y0 = 2.475 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.8
1.6
2.4
3.2
4.
Time (min)

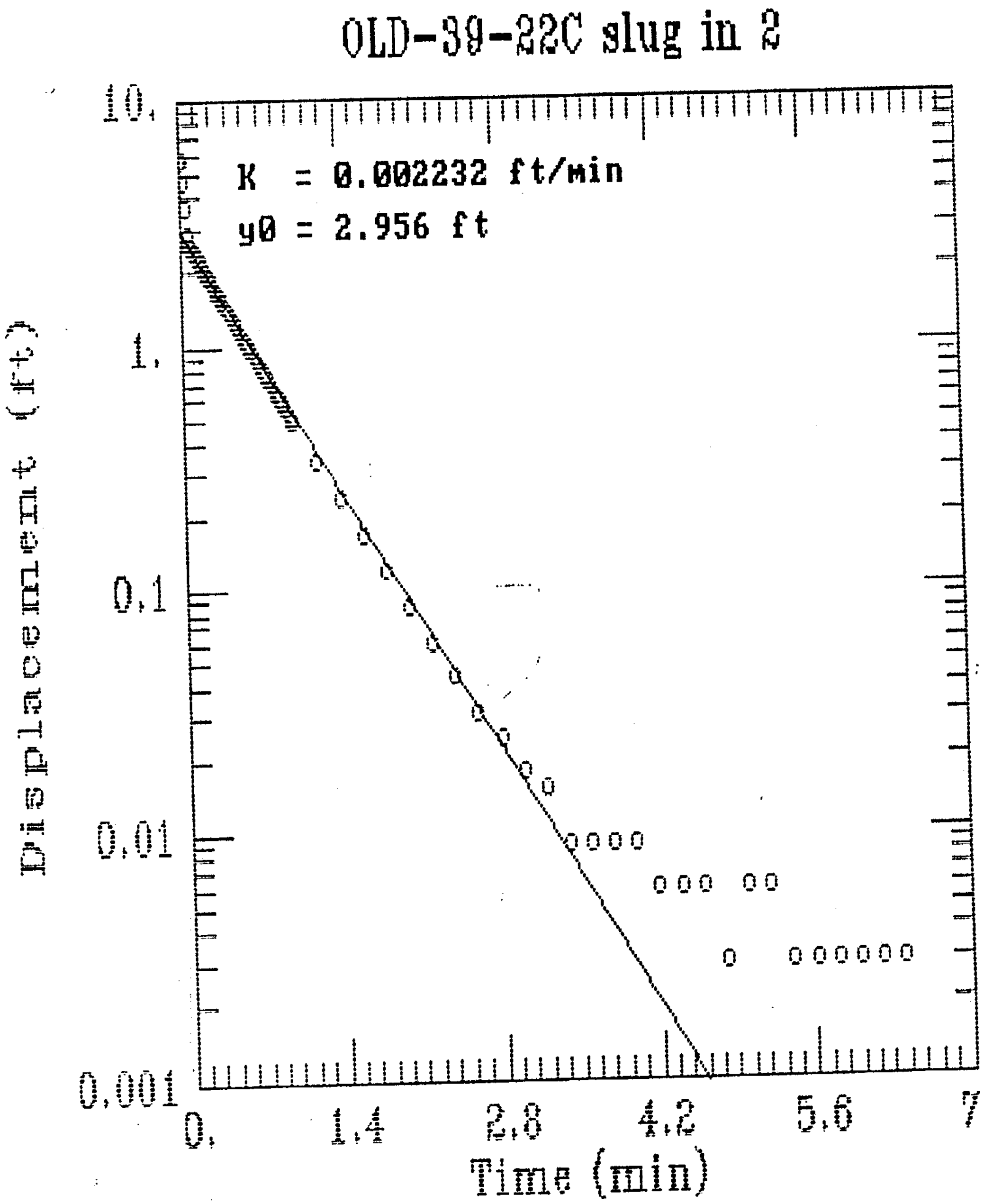


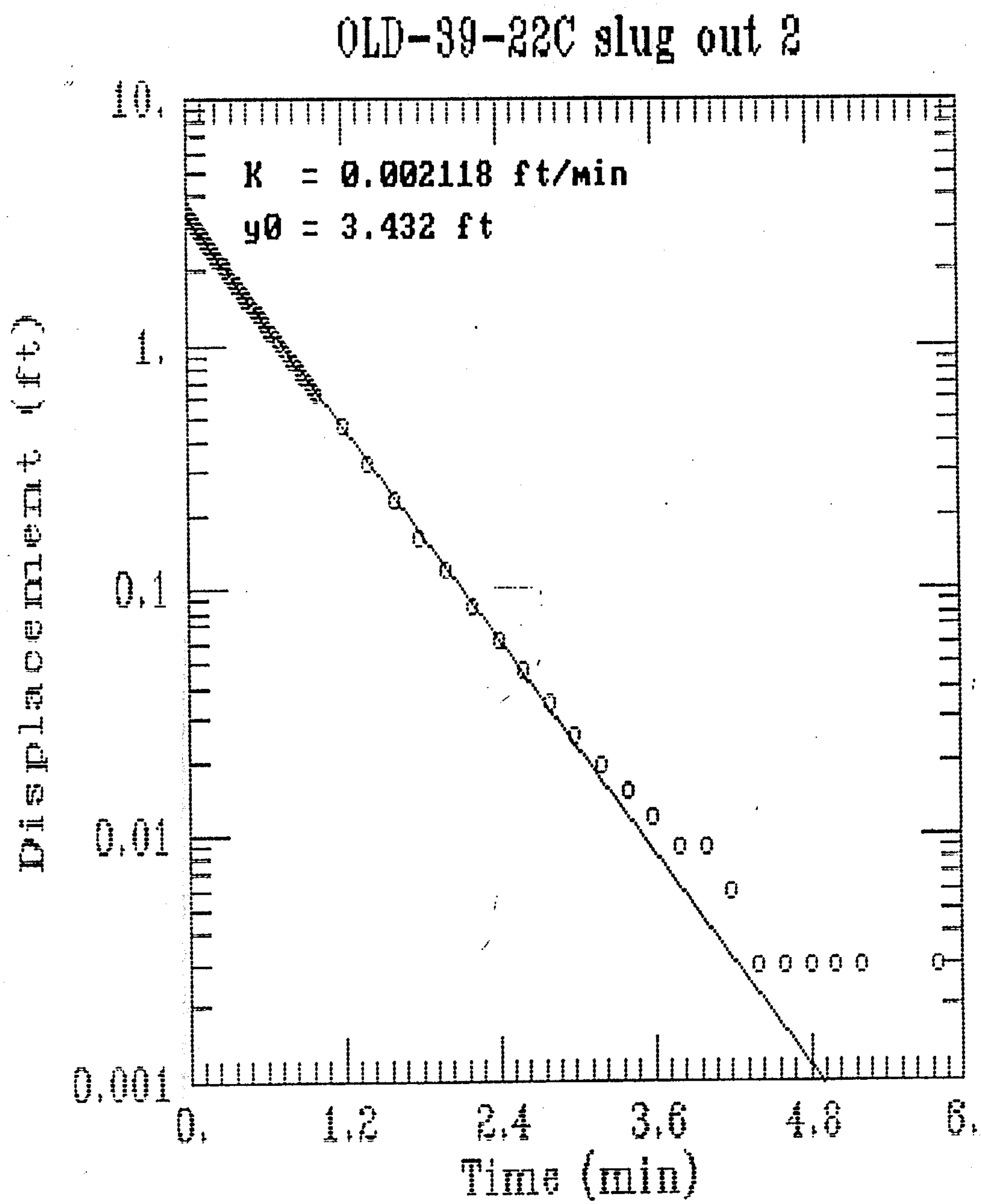
OLD-39-21B slug out 2
K = 0.00387 ft/min
y0 = 2.172 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.
Time (min)

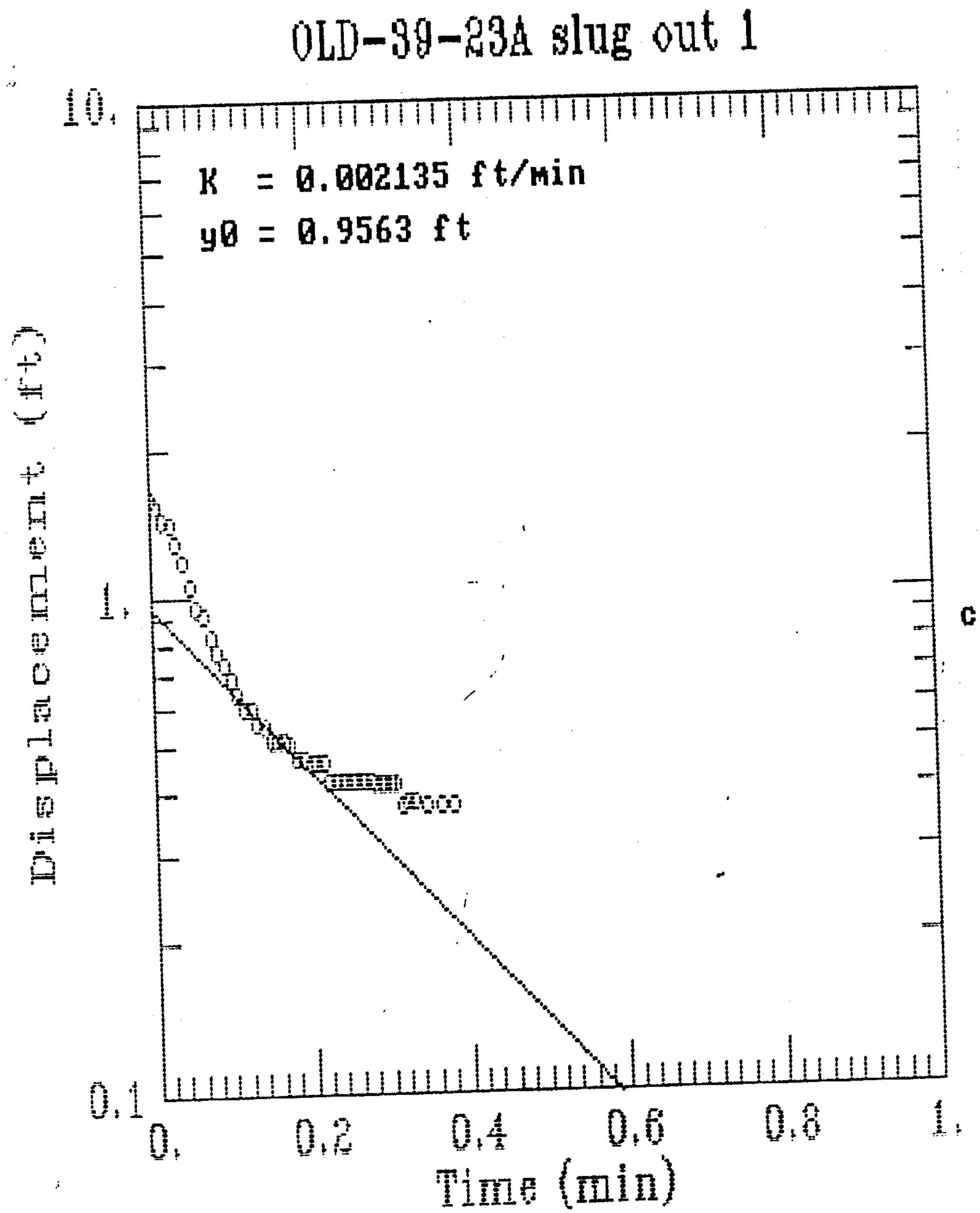
OLD-39-22C slug out 1

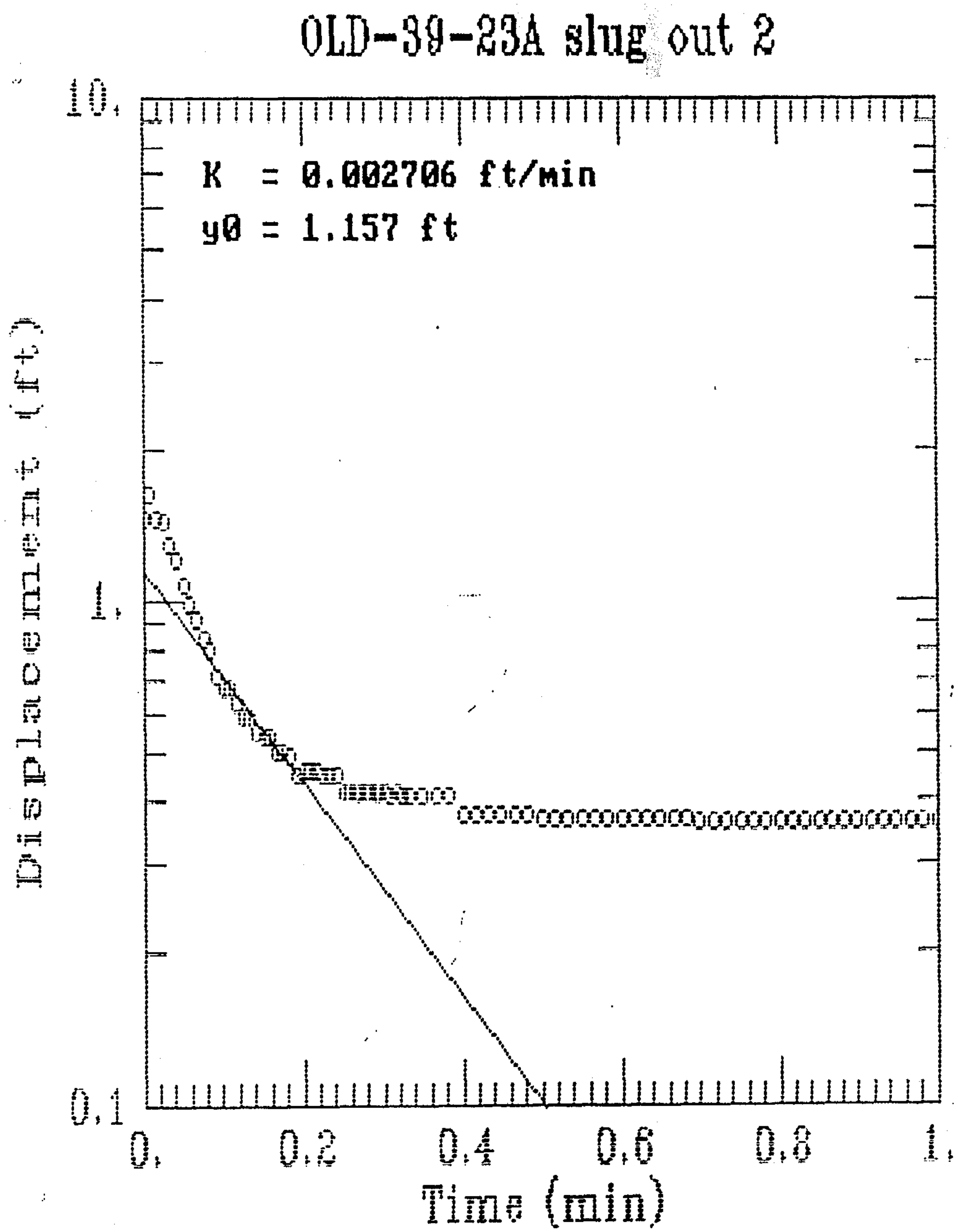


c t

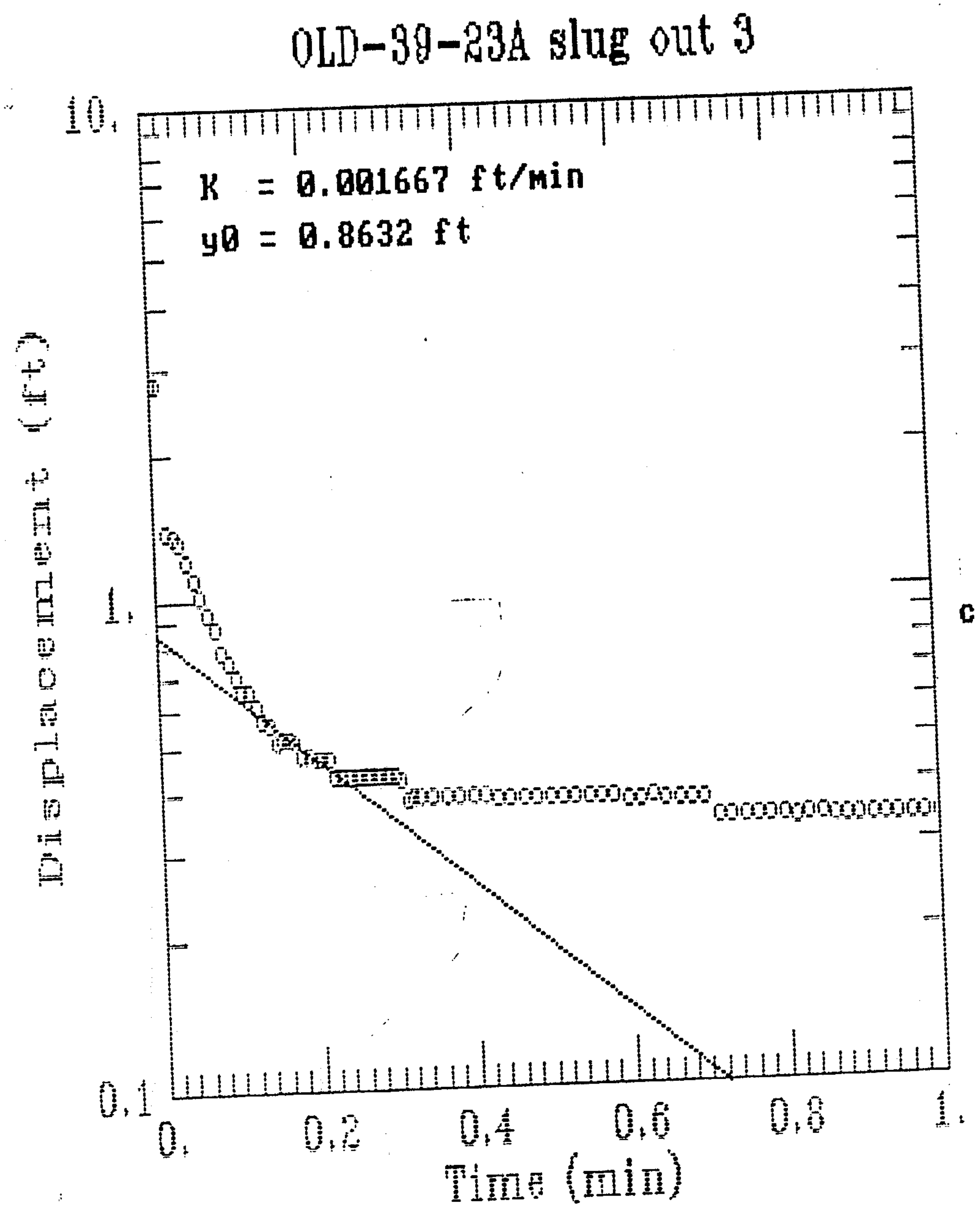

OLD-39-22C slug in 2
K = 0.002232 ft/min
y0 = 2.956 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.4
2.8
4.2
5.6
7.
Time (min)

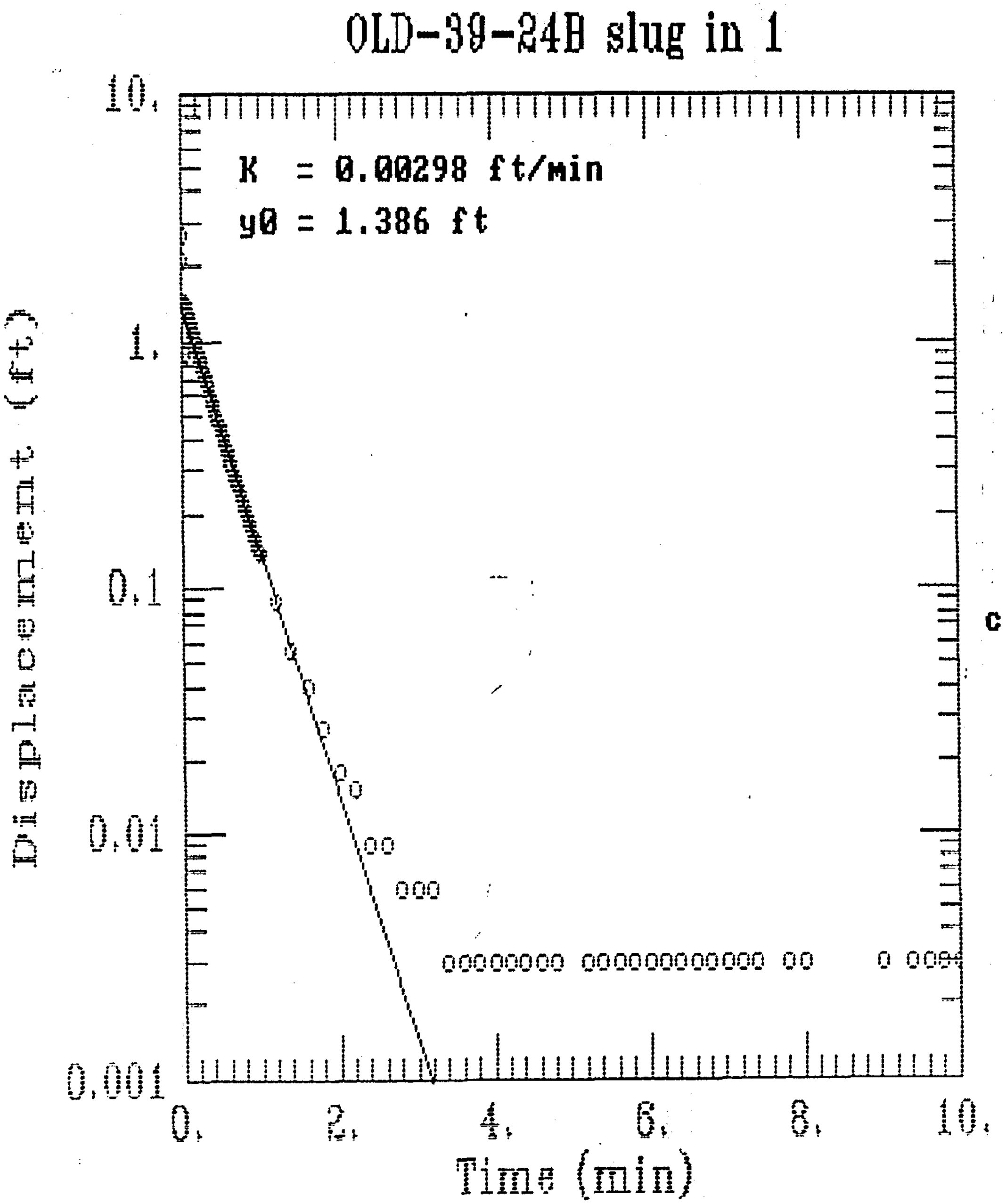

OLD-39-22C slug out 2
K = 0.002118 ft/min
y0 = 3.432 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
1.2
2.4
3.6
4.8
6.
Time (min)


OLD-39-23A slug out 1
K = 0.002135 ft/min
y0 = 0.9563 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.
0.2
0.4
0.6
0.8
1.

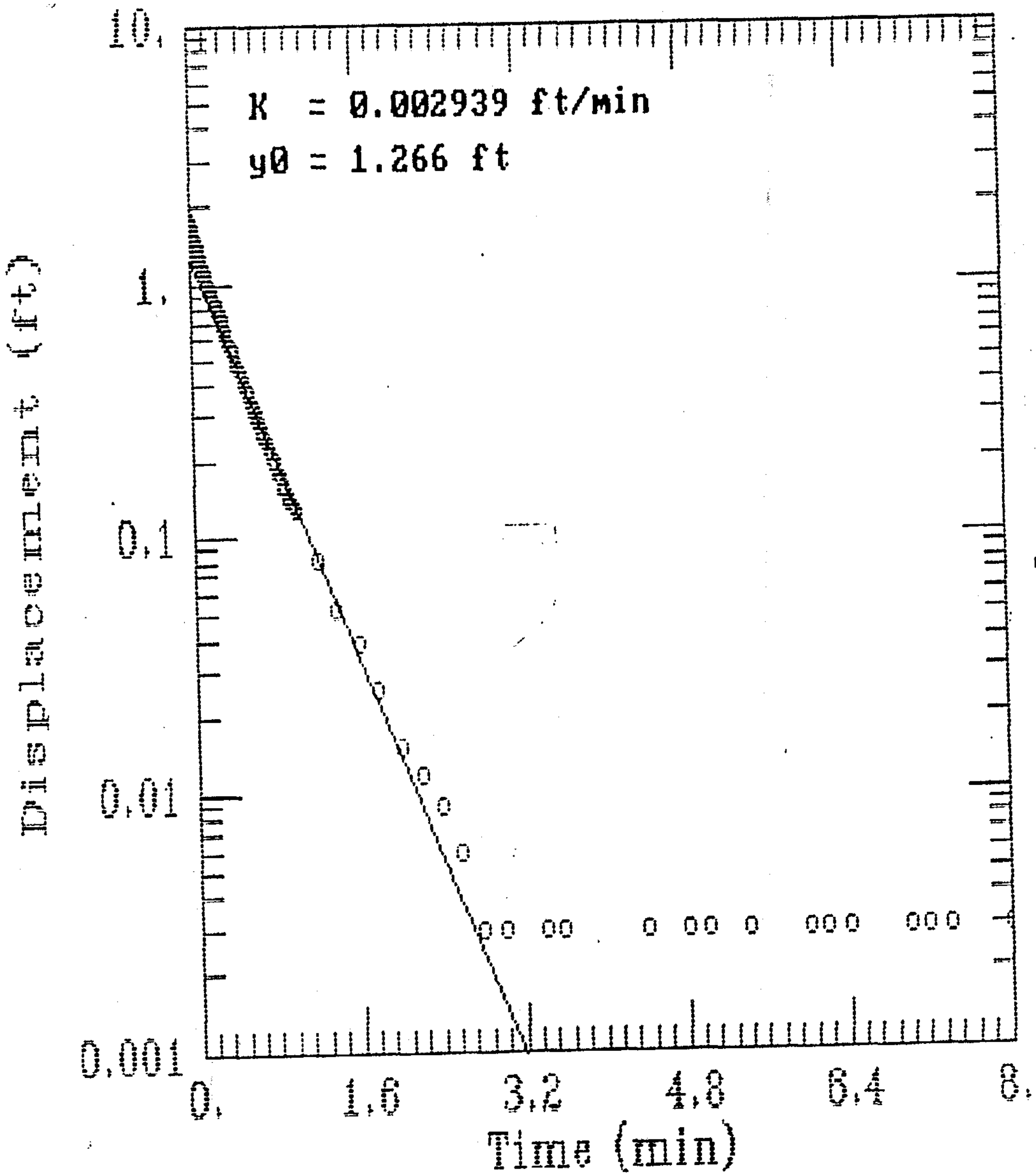


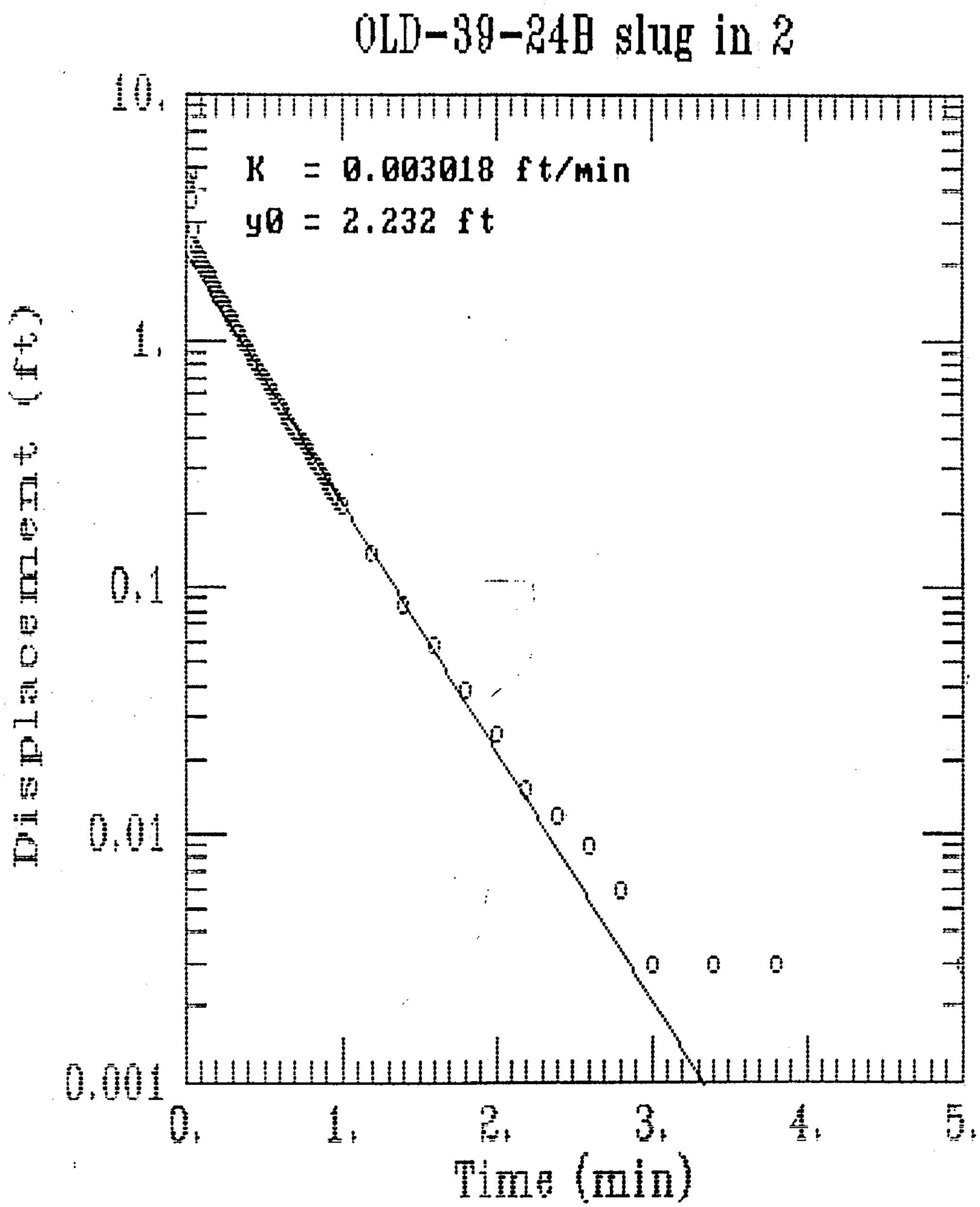
OLD-39-23A slug out 2
K = 0.002706 ft/min
y0 = 1.157 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.
0.2
0.4
0.6
0.8
1.

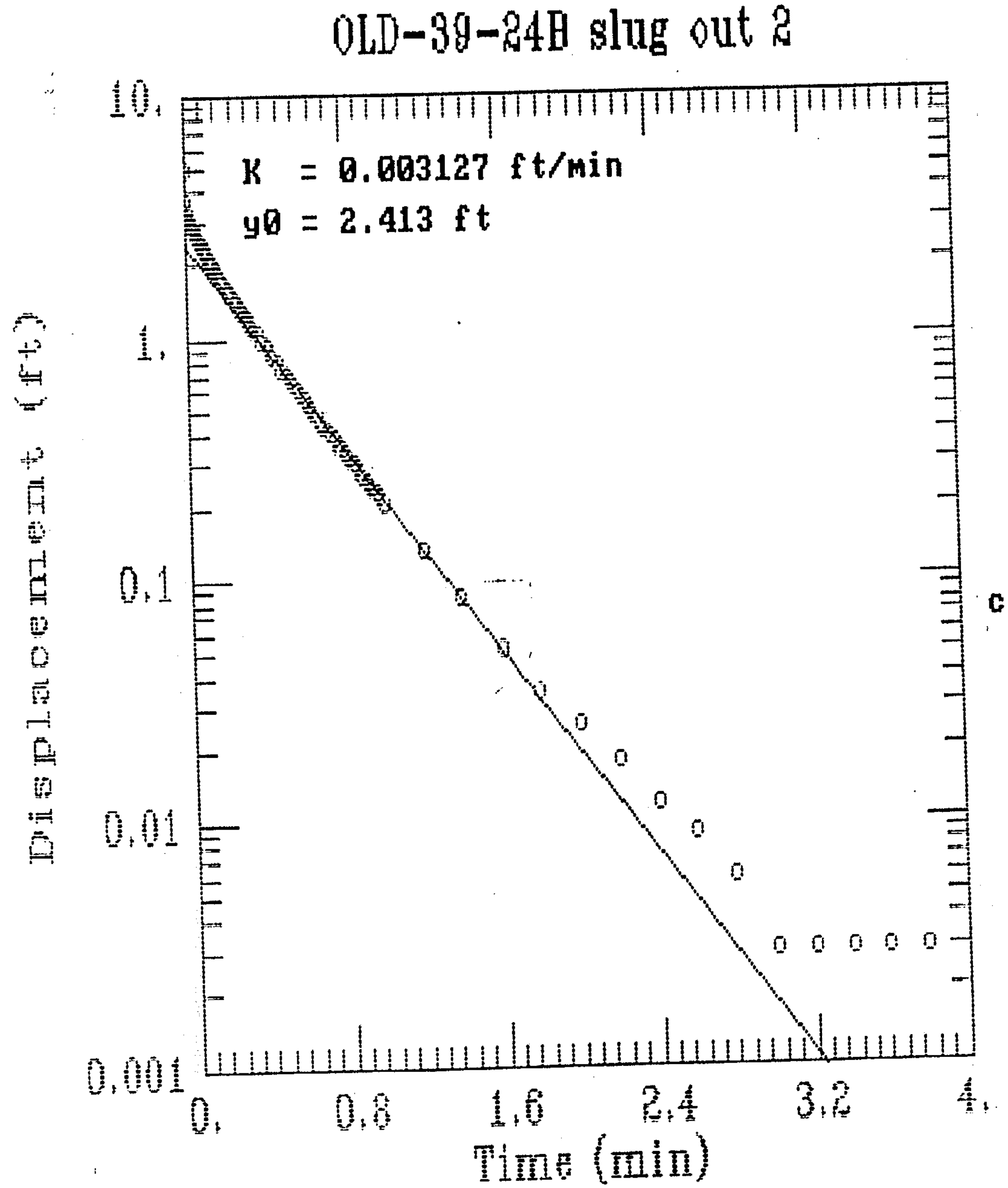

OLD-39-23A slug out 3
K = 0.001667 ft/min
y0 = 0.8632 ft
Displacement (ft)
10.
1.
0.1
0.
0.2
0.4
0.6
0.8
1.
Time (min)


OLD-39-24B slug in 1
K = 0.00298 ft/min
y0 = 1.386 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
2.
4.
6.
8.
10.

OLD-39-24B slug out 1

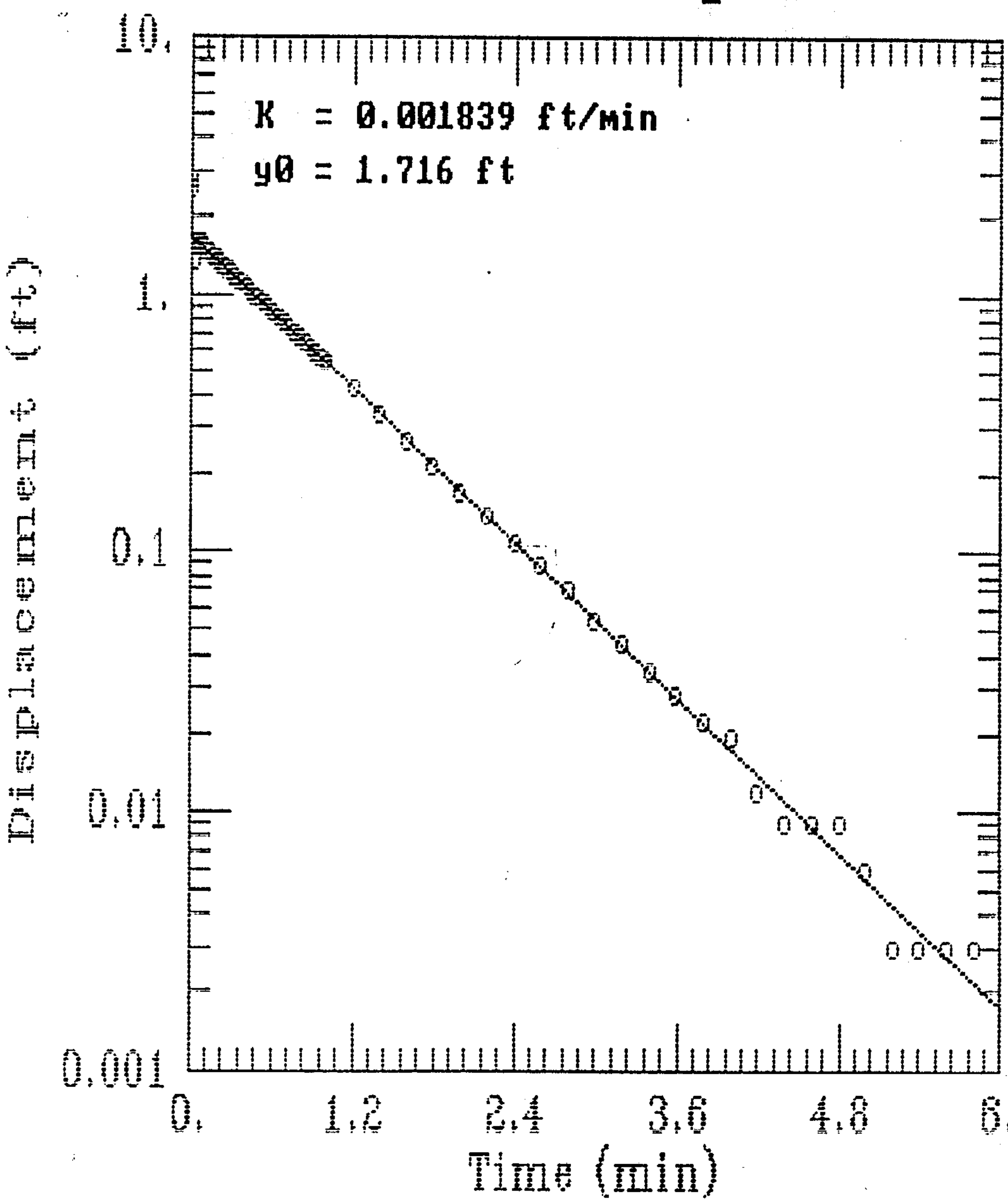



OLD-39-24B slug in 2
K = 0.003018 ft/min
y0 = 2.232 ft
Displacement (ft)
Time (min)
10.
1.
0.1
0.01
0.001
0.
1.
2.
3.
4.
5.

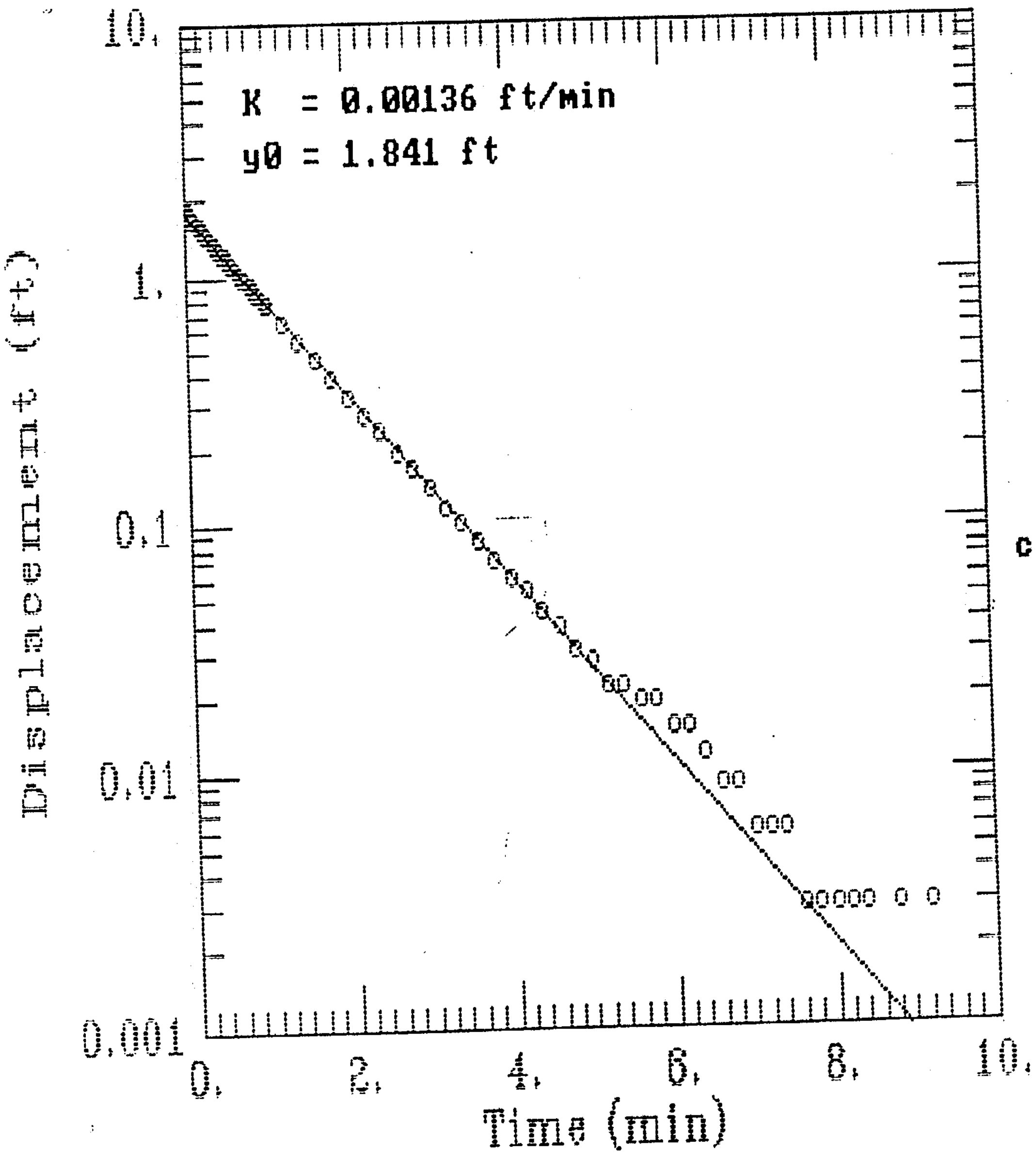


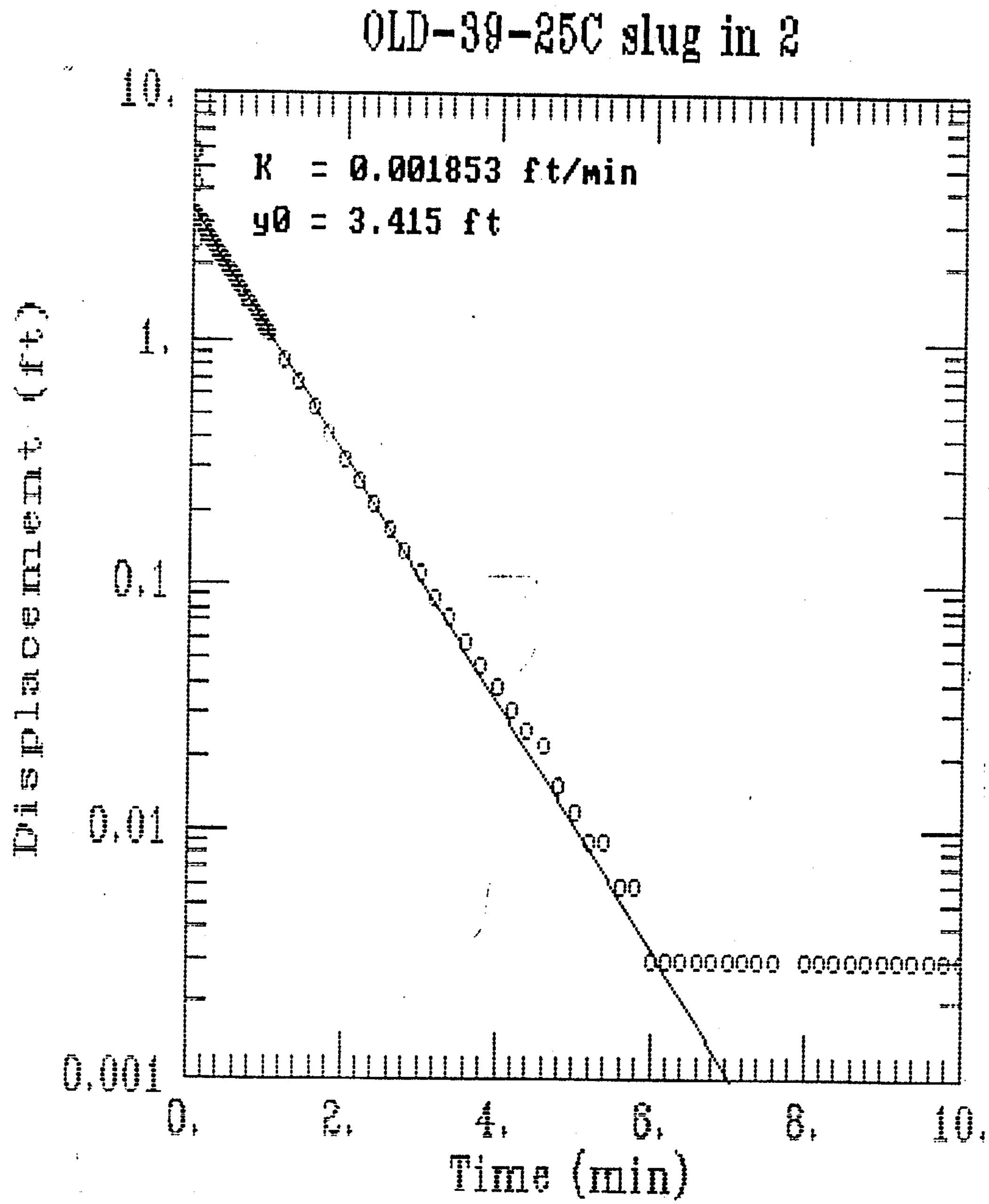
OLD-39-24B slug out 2
K = 0.003127 ft/min
y0 = 2.413 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
0.8
1.6
2.4
3.2
4.
Time (min)

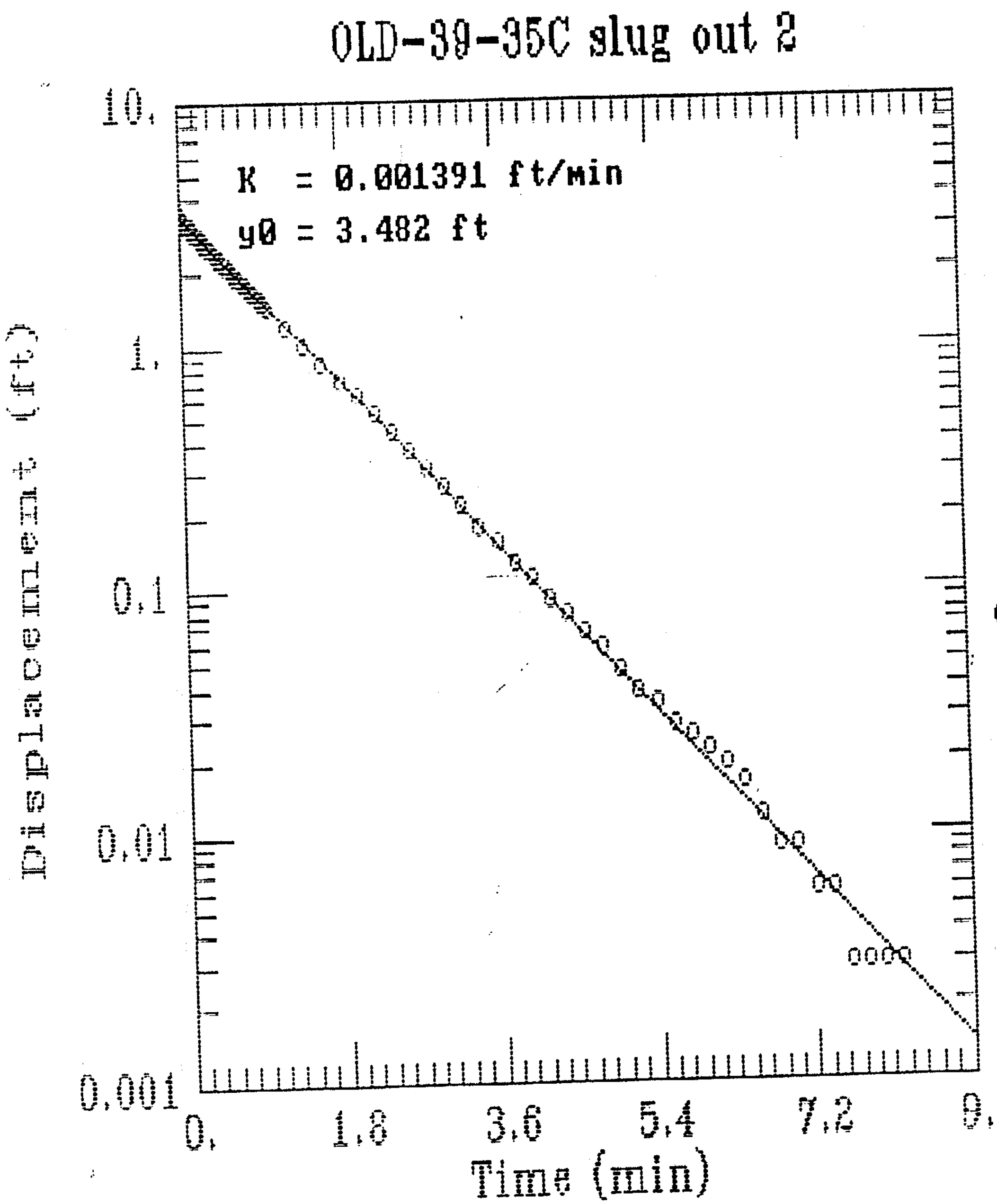
OLD-39-25C slug in 1



OLD-39-25C slug out 1




OLD-39-25C slug in 2
K = 0.001853 ft/min
y0 = 3.415 ft
Displacement (ft)
10.
1.
0.1
0.01
0.001
0.
2.
4.
6.
8.
10.
Time (min)



OLD-39-35C slug out 2
K = 0.001391 ft/min
y0 = 3.482 ft
10.
1.
0.1
0.01
0.001
Displacement (ft)
0.
1.8
3.6
5.4
7.2
9.
Time (min)